X

PROGRESS REPORT

OF THE

FOREST SURVEY BRANCH

FOR

1892-93.

CALCUTTA:
OFFICE OF THE SUPERINTENDENT OF GOVERNMENT PRINTING, INDIA.
1894.

No. 367 F., dated 30th March 1894.

From—E. D. MACLAGAN, Esq., C.S., Under-Secretary to the Government of India, Department of Revenue and Agriculture,

To—The Surveyor General of India.

I AM directed to acknowledge the receipt of your letter No. 434, dated the 9th ultimo, forwarding the Report of the Forest Survey Branch for 1892-93, together with your remarks on the administration of the Branch during the year.

2. The operations of the year have been amply reviewed in your letter under reply and do not call for further criticism or remarks. I am to say that the Government of India concur in your opinion that the results obtained were highly satisfactory and reflect credit on the Superintendent, as well as on the staff of officers serving under his orders.

No. 368 F.

COPY, with copy of the letter replied to, forwarded to the Inspector-General of Forests for information.

No. 434-S., dated Calcutta, 9th February 1894.

From—Colonel H. R. Thuillier, C.I.E., R.E., Surveyor General of India,

To—The Secretary to the Government of India, Revenue and Agricultural Department.

I have the honour to forward the annual Progress Report of the Forest Survey Branch of the Forest Department for the year 1892-93, submitted by Mr. W. H. Reynolds, Superintendent of the Branch.

2. The operations which were in progress during the preceding season were all continued during the year under report, *viz.*, those in Bashahr, Punjab; in the districts of Raipur, Bhandara, and Mandla, Central Provinces; in the district of Goalpara, Assam; and in the Tenasserim Forest Circle of Lower Burma. In addition to these, forest surveys were commenced in the Pilibhit and Bhira divisions of the Oudh Circle; in the Pyinmana division of Upper Burma; and in the districts of Balaghat and Narsinghpur, Central Provinces.

3. Appendices A and B of the Report give the details of the field-work and mapping executed during the year.

The total area topographically surveyed on the different scales amounts to 1,804 square miles, of which 80 square miles were mapped on the 16-inch scale, 1,087 on the 4-inch scale, 7 on the 2-inch scale, and 630 on the 1-inch scale. The total area shows an increase of 218 square miles over that of the preceding year, which is explained by the fact that the work in the Pilibhit and Kheri districts of the Oudh Circle is of an easier nature, and the details to be mapped therein are less numerous, than is usually the case. A statement of the classes of areas surveyed is given in Appendix D, from which it appears that, of the total area, 851 square miles lay in demarcated forests and 953 square miles in other lands.

Triangulation was extended over an area of 623 square miles, as against 2,357 squares miles in the preceding year; the decrease being due to the fact that it was only necessary to carry on this class of work in the Tenasserim Circle, Lower Burma; in the Narsinghpur district, Central Provinces; and in Bashahr, Punjab; a sufficient area having been triangulated in advance for the season's detail survey in the other localities. The traverse work done amounted to 665 linear miles, covering an area of 636 square miles, as against 205 linear miles traversed over an area of 175 square miles last year. The traversing lay principally in Upper Burma, where it was carried on under great difficulties.

4. The usual methods of checking the detail survey were employed. Where possible, *partal* lines were run through the work on completion, and in hilly country instrumental contour lines were laid down at fixed vertical intervals. The number of linear miles of check surveys amounted to 562, and in addition 106 miles of levelling were executed. The work was found to be accurate in all the localities except Assam, where an area of 31·5 square miles had to be re-surveyed. The surveyor in fault in this case was dismissed.

5. In Bashahr, the cost-rate per square mile of the detail survey on the 4-inch scale was Rs. 59, and for that on the 1-inch scale Rs. 10·5. The rate for the 4-inch work is rather higher, and that for the 1-inch work rather lower, than last year, when they amounted to Rs. 53·3 and Rs. 13·7, respectively.

In the Central Provinces, the average cost-rate per square mile of the entire season's work, including the 16-inch boundary surveys and the preparation of forest distribution and soil records, as well as the cost of mapping, &c., but excluding triangulation, was Rs. 50, as compared with Rs. 47 last year. The slight increase is due to the loss of time caused by the necessity of moving two of the detachments into new districts during the field season.

In the North-Western Provinces and Oudh, the cost-rate per square mile of the detail survey on the 4-inch scale was for the forests in Pilibhit Rs. 18·6,

and for those in Bhira Rs. 17·3. These rates are comparatively low, owing to the easy nature of the country and the absence of details to be mapped.

In Assam, the cost-rate per square mile of the 4-inch detail survey, including the classification of forest growth and soils, was Rs. 89·9. This rate is very high when compared with last year's rate, *viz.* Rs. 42·3, which is accounted for partly by the large area over which the tracts under survey were scattered, which rendered it more costly to provision the camps, and partly by the fact that the area surveyed last year had to be checked during this season, which occupied several of the best surveyors for a considerable time.

In Burma, the cost-rate per square mile of the 4-inch detail survey in the Tenasserim Circle was Rs. 81·7, as compared with Rs. 86 in the previous year. That of the triangulation in this Circle was Rs. 16 per square mile, and of the traversing in the Pyinmana district Rs. 36-3.

6. The work in each of the various localities was visited and inspected from time to time by Mr. W. H. Reynolds. Leaving his head-quarters on the 22th November 1892, he proceeded to the Pilibhit district, in Oudh, to start the new operations there, after which he went to the Pyinmana district, Upper Burma, with the same object, and remained with that party from the 11th to the 28th December. He next visited the party working the forests on the Siam frontier, in the Tenasserim Circle, where he remained till the 12th January 1893, when he proceeded to the Central Provinces. From the 23rd January to the 19th February he was engaged in inspecting the operations in those districts, after which he returned to Dehra Dun to assist in the examinations of the students of the Forest School. On the 7th April he again visited the party working in Pilibhit and Kheri, and on the 14th idem he left for Assam, where he remained until the 24th, when he returned to Dehra Dun. Early in June he proceeded to Bashahr, where he remained until the 6th July. He then returned to head-quarters at Dehra Dun for the remainder of the year.

7. A summary of the mapping done during the year is given at page 4 of the Report. Very satisfactory progress was made in the fair-drawing of the season's maps. The publication of the forest maps is still delayed by the inability of the small establishment in the Photozincographic Office at Dehra to cope with the increased demands from the Forest Survey Branch and to reproduce them as quickly as they are prepared. At a conference held at Simla in June 1893, it was decided to print a preliminary issue of the sheets by the cyanotype process, in order to meet the pressing requirements of the Forest Department, pending the publication of the maps by photozincography. It is expected that when the enlargement of the photozincographic establishment and plant at Dehra, which is now under consideration, has been properly arranged, there will be no further difficulty in meeting the requirements of the Forest Department promptly.

8. The results of the year's work must be considered highly satisfactory, and show that the Forest Survey Branch continues to be efficiently supervised by Mr. Reynolds. Credit is also due to the officers under him, all of whom discharged their duties to his entire satisfaction.

9. The total expenditure for the year amounted to Rs. 1,25,513, as compared with Rs. 1,24,649 in the preceding year and Rs. 1,10,164 in 1890-91. The slight increase is due to the commencement of new operations in Oudh and Upper Burma.

10. I have to add that I inspected the office of the Forest Survey Branch at Dehra in October last, and was well satisfied with all I saw. The records were found systematically kept, and the general arrangements and organisation of the office excellent. The maps are well drawn, and the field plans give evidence of the surveys having been made with care.

G. C. Press, Simla—No. 31 R. & A. D.—17-4-94.—250.

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BENGAL SECRETARIAT LIBRARY

ANNUAL PROGRESS REPORT

OF THE

FOREST SURVEY BRANCH OF THE FOREST DEPARTMENT

FROM 1st OCTOBER 1892 TO 30th SEPTEMBER 1893.

BY

W. H. REYNOLDS, Esq., F.R.G.S.,
SUPERINTENDENT OF FOREST SURVEYS.

The operations of the Imperial Forest Survey Branch that are now reported on are for the survey year of 1892-93, or for the period 1st October 1892 to the 30th September 1893.

Direction and superintendence.

2. The direction and superintendence of the surveys have throughout the year been in the hands of Mr. W. H. Reynolds.

THE SEASON'S FIELD WORK.

Surveys in progress.

3. In continuation of the previous season's operations, field work was carried on in Bashahr in the Punjab, in the districts of Raipur, Bhandara, and Mandla in the Central Provinces, the district of Goalpara in Assam, and in the Tenasserim Forest Circle of Lower Burma.

New surveys.

4. In addition to the above, field operations were commenced (*vide* paragraph 13 of last year's report) in the Pilibhit and Bhira Divisions of the Oudh Circle and in the Pyinmana Division of Upper Burma, as well as in the Balaghat and Narsingpur Districts of the Central Provinces.

The forest surveys in the Narsingpur and Balaghat Districts were taken up in accordance with the programme sanctioned in the correspondence ending with the Inspector General of Forests' endorsement No. 828, dated 16th October 1891, to the Superintendent of Forest Surveys.

Duration of field season.

5. The average duration of the field season was about seven months for parties working in the Central Provinces, those working in the Himalayas were out for about five months, the Oudh and Upper Burma parties were in the field for about six and-a-half months, and in Lower Burma and Assam the field parties were out for six and five and-a-half months, respectively.

Area topographically surveyed.

6. The total area topographically surveyed during the year on various scales amounts to 1,804 square miles as against 1,586 square miles in the previous

year and 1,381 square miles in 1890-91. The total area is made up as follows:—

Surveyed on the 1-inch scale,			630	square	miles.
„	2-inch	„	7	„	„
„	4-inch	„	1,087	„	„
„	16 inch	„	80	„	„
	Total		1,804		

Forest growth and soil records.

7. The usual records illustrating the distribution of forests were prepared at the time of survey for all areas mapped on the 4-inch scale, and in the Central Provinces additional information regarding the classification of soils was also recorded.

Check surveys.

8. The areas topographically surveyed were checked, where possible, by running "partal" or check surveys through the work after it was finished, and in hilly and mountainous country instrumental contour lines were run at fixed vertical distances. Five hundred and sixty-two linear miles of check surveys were run, as well as 106 miles of levelling with spirit-level, which also answered the purposes of check surveys. With the exception of portions of the Assam work, which were subsequently revised, the work stood the tests that were applied.

Triangulation.

9. Triangulation was extended over an area of 628 square miles as compared with 2,357 square miles in the previous season. The tracts triangulated are situated on the Siam frontier in Lower Burma, the Narsingpur District in the Central Provinces, and the Bashahr State in the Punjab. In most of the other tracts under survey it was not found necessary to extend this branch of the work, as it was well in advance of the topographical survey.

Traversing.

10. Over an area of 636 square miles 665 linear miles of traversing was run with theodolite and two chains. The greater part of this work was carried on in Upper Burma under very great difficulties.

Superintendent's inspection.

11. During the field season the Superintendent of Forest Surveys visited each of the 8 field detachments in turn and answered all references that were made to him, and satisfied himself that the accounts were in order and the field work being conducted efficiently.

Comparison with previous year.

12. As compared with the previous year, the season's outturn of topographical work and traversing is in excess of that reported in 1891-92, but the triangulation is less. The fact of the Kheri and Pilibhit forests in Oudh being exceedingly easy to work in, and the details to be mapped comparatively fewer than are met with elsewhere, contributed largely towards the more favourable outturn of topographical work during the present year.

Summary of outturn of field work.

13. A summary of the outturn of field work will be found in Appendix A, and in Appendix D is given a statement of the classes of area surveyed.

OFFICE WORK.

Computations.

14. In Appendix A will be found an abstract of the outturn of the season's computations. The number of triangles computed in duplicate was 940, and the rectangular co-ordinates of 486 trigonometrical stations and of 10,261 traverse stations were deduced. To determine the heights above sea-level of 449 stations, 892 additional triangles were computed.

The rectangular co-ordinates of 762 points were converted from latitudinal and longitudinal values, and 8,547 co-ordinates of revenue survey stations were converted into rectangular co-ordinates, referrible to the Forest survey stations of origin. From 1,770 observations with the tangent scale clinometer the heights above sea-level of 1,014 points were computed, and abstracts were prepared from triangulation field books of 1,668 horizontal angles.

All the above computations were worked in duplicate.

Areas.

15. The forest areas in 11 standard 4-inch sheets of Bashahr, 50 sheets of Jubbulpore, 17 sheets of Raipur, 16 sheets of Bhandara, 23 sheets of Goalpara, and 16 sheets of the Kumaun and Garhwal Districts have been deduced, as well as other miscellaneous areas for forest purposes.

Provincial map records.

16. The map records of the forests in the several provinces under the Government of India, as well as Madras, continue to be posted as new reserves are gazetted or alterations in forest boundaries are notified, and, as far as possible, the forests in the Bombay Presidency are also located on the provincial map records.

A portfolio is kept for each province which contains (i) a copy of the best available map for each separate reserve in the province, (ii) a district map on which is shown the reserved and protected forests by Forest Divisions, (iii) a provincial map showing the forests by circles or Conservator's charges, and (iv) a map of India showing the distribution of the entire forest areas that have been gazetted under the Indian Forest Laws, as well as the limits of forest charges.

Lists of best available maps.

17. In connection with the above is kept a tabulated statement which contains useful information regarding the portfolio maps, and in which is recorded the number and date of the Government notifications whereby each forest has been constituted a reserved or protected forest.

Alphabetical list of forests.

18. An alphabetical list is also under preparation of all the gazetted forests in India, which contains a reference to the best available maps on which each separate forest reserve is to be found.

Up-keep of provincial map records.

19. The forest map records are constantly undergoing revision owing to new and better maps being made available from time to time for the Forest Department, or new tract of forests reserved, or from the alterations and revisions of forest boundaries.

The labour of keeping the provincial map records posted to date is very considerable and requires the services of not only a skilled draughtsman but of a highly intelligent and well-trained assistant. The work during the past years has been ably carried on by Mr. Descubes.

MAP-DRAWING.

20. A summary of the original drawings under preparation or published during the year, as well as other miscellaneous office work executed by the Forest Survey Branch, is given in Appendix B.

Appendix B.

21. The revised map of India in four sheets, on the scale of 48 miles=1 inch, showing the distribution of forest areas gazetted under the Indian Forest Laws, which was reported (in paragraph 88 of last year's progress report) to be in the press, has been published and copies have been issued according to the official distribution list.

India.

22. A second edition of sheet No. LIII of the 4-inch forest map of Kumaun and Garhwal has been published; and sheets Nos. LIII A and LIVA of the same series have also passed through the press.

North-Western Provinces and Oudh Central Circle.

23. For the School circle two sheets of the leased forests in the Terhi-Garhwal State on the 4-inch scale have been published, as well as a map on a similar scale of the Karamba forest block in the Jaonsar Division and of the Lachiwala Coppice circle in the Dehra-Dun Division. Two sheets of the leased forests in Tehri-Garhwal on the 4-inch scale are in progress.

School Circle.

24. For the Oudh Circle an index map to the Forest surveys in the districts of Kheri and Pilibhit on the 1-inch=8 miles scale has been published and ten sheets on the 4-inch scale of the reserved forests in the Pilibhit District, as well as 5 sheets on a similar scale of the Bhira forests in the Kheri District are in progress. The drawing of the Pilibhit and Bhira sheets is finished, but owing to a press of work in the Photo-zincographic Office they cannot at present be sent to press.

Oudh Circle.

25. Of the Punjab maps, 6 sheets on the 4-inch scale of the Bashahr State have been published during the year, 4 sheets have gone to the press, and 12 are in progress, one of which is ready for the press. Sheets Nos. 347 and 353 of Bashahr on the 1-inch scale, which are to constitute Forest, Range maps, are in progress. A chart of triangulation (sheet No. 347 of Bashahr) on the 1-inch scale is ready for the press, and three other charts of Bashahr triangulation on a similar scale are in progress.

Punjab.

26. Three standard sheets on the 4-inch scale of the reserved forests in the district of Goalpara have been sent to the press and 22 sheets on a similar scale are in progress.

Assam.

27. A map of the Umbarde Reserve in the Darwha taluk and a map of the Phiski Reserve in the Wun taluk, both on the 8-inch scale, have been published, and maps of three other reserves on the same scale, and of two reserves on the 4-inch scale, have been sent to the press. A map of the Melghat taluk in three sheets on the scale of 1 inch=1 mile is nearly ready for the press, but owing to a press of work in the Photo-zincographic Office, it is feared it will not be possible to publish this map at present.

Berar.

28. During the year sheet No. 107 $\frac{S.E.}{5}$ on the scale of 4 inch=1 mile, and containing forests in the Jubbulpore District, has been published; 67 sheets on a similar scale have been sent to press, of which a preliminary blue print edition has been issued of 28 sheets. Twelve sheets of the same series are still in progress.

Central Provinces, Northern Circle, Jubbulpore.

29. An index map to the Forest surveys in the Narsingpur District on the scale of 8 miles=1 inch has been published.

Narsingpur.

30. The six sheets of the Ahiri forests in the Chanda District reported last year as being in the press still remain to be published, but a preliminary blue print edition of the sheets has been issued.

Southern Circle, Chanda.

31. Of the 4-inch sheets of the Raipur forests, 14 sheets are in the press, 2 are ready for the press, and 10 are in progress.

Raipur.

32. Thirteen sheets, on the 4-inch scale, of the forests in the Bhandara District have been sent to the press, and three others are ready for publication.

Bhandara.

33. An index map to the Forest surveys in the Balaghat District has been published on the scale of 8 miles = 1 inch.

Balaghat.

34. For the Pegu Circle a map of the Kangyi Reserve on the scale of 2 inches=1 mile has passed through the press.

Lower Burma, Pegu Circle.

35. Ten standard sheets on the 4-inch scale of the forests in the Salween Division are in progress; the drawing is finished, but the printing remains to be completed before they can go to the press.

Tenasserim Circle.

36. The two maps that were reported as being in progress for Upper Burma last year have been published, and an index map to the Forest surveys in the Pyinmana District on the scale of 8 miles=1 inch has also been published.

Upper Burma.

37. A set of 220 maps was prepared for the Chicago Exhibition as a part of the contribution from the Forest Department.

Exhibition.

38. For various districts and Forest officers 114 tracings were prepared; 666 maps were cut up and mounted in book form, and 1,623 printed maps were coloured.

Tracings and other miscellaneous work.

Tracings were also prepared for 53 standard 4-inch sheets illustrating the distribution and density of forests that came under survey.

39. The maps of the Forest Survey Branch continue to be photozincographed at the office of the Trigonometrical Branch of the Survey of India Department, but the cost of this work is defrayed by the Forest Survey Branch.

Publication of Forest Survey maps.

The publishing of the Forest map has fallen somewhat into arrears, and at a Conference held at Simla early in June it was decided that, owing to the pressing requirements of the Forest Department in the Central Provinces, a preliminary edition of cheap blue prints should be struck off for immediate

requirements pending the publication by photo-zinco of the usual edition of the maps. A considerable number of cyanotype or blue print sheets have already been issued, and before the beginning of the working season it is expected that a sufficient number of sheets will be in print for the special and immediate requirements of the Central Provinces. But in the meantime the publication of the Forest maps of other provinces, which are of equal importance to the maps of the Central Provinces, is being retarded.

EXPENDITURE FOR THE YEAR.

Expenditure.

40. The total expenditure for the year incurred by the Forest Survey Branch in the several provinces in which survey operations were in progress, as well as for other special work carried on at the head-quarters office, and not connected with these surveys, was R1,25,513 against R1,24,649 in the previous year. The increase in expenditure is due chiefly to the survey of the Oudh and Upper Burma forests having been taken in hand during the year.

Cost of work done by Survey of India Department for Forest Survey Branch.

41. The charges for the year on account of work done in the Survey of India Photo-zincographic Office at Dehra-Dun, including the cost of maps received from the Calcutta Office, amounts to R4,377.

Expenditure under provincial headings.

42. Appendix C exhibits in detail, and arranged under provincial headings, the expenditure for the survey year under report.

Cost-rates.

43. The cost-rates of the several provincial surveys are recorded under the heading of the respective provinces in which surveys were in progress, and under these provincial headings is also given detailed information regarding each survey.

Programme for 1893-94.

44. Survey operations during the coming field season of 1893-94 will be carried on in the following Forest Divisions:—

(i)	Bashahr	Punjab.
(ii)	Balaghat	Central Provinces.
(iii)	Seoni, Nagpur	Central Provinces.
(iv)	Raipur	Central Provinces.
(v)	Narsingpur	Central Provinces.
(vi)	Kheri, Gonda	Oudh.
(vii)	Salween, Pyinmana	Burma.

PUNJAB.

Bashahr survey.

45. The survey of the Bashahr State was resumed in continuation of the previous year's operations, and during the early part of the season 4-inch topographical work was carried on in the Pabar valley. Later on, after the rains set in, the surveyors moved higher up the Sutlej valley and continued to work in the Chini Range, in the neighbourhood of Lakhti, until the close of the survey year. One-inch work was carried on in the higher ranges situated in the northern and western portions of the Bashahr State and touching on the Spitti and Chinese-Tibet boundary.

Triangulation.

46. A small area of 30 square miles was triangulated in the Pabar valley to afford additional trigonometical points in the tracts adjoining the Jubal and Tehri States.

Area topographically surveyd.

47. The surveyors employed on topographical work took the field early in May and were still in Bashahr at the close of the survey year.

The total area topographically surveyed amounts to 754 square miles against 525 square miles in the previous season; of this area, 124 square miles were surveyed on the 4-inch scale and 680 square miles were mapped on the 1-inch scale.

Throughout the areas surveyed on the 4-inch scale, instrumental contours, as usual, were run at vertical intervals of 500 feet, and a record of forest growth was also prepared.

The tracts surveyed on the 1-inch scale range from 12 to 20,000 feet above sea-level and are most difficult of access; and inasmuch as it is most difficult to obtain either fuel or ordinary supplies owing to the country being sparsely populated and so elevated, very great hardships have had to be endured by all who took part in the survey. The work for the most part was done by Messrs. E. and C. Litchfield and much credit is due to them, more particularly to Mr. E. Litchfield, for the excellent field sheets that have been produced.

Supervision of field party.

48. Mr. W. H. Reynolds, Superintendent of Forest Surveys, was with the Bashahr Party during June and the early part of July, and when the surveyors moved into the Upper Sutlej valley early in August, the supervision of the work devolved on Mr. E. Litchfield.

Index map showing progress.

49. The progress of the survey is illustrated on the Bashahr index map which is attached to this report, and the details of the field work will be found in Appendix A.

Total expenditure, Appendix C.

50. The total expenditure incurred on account of the Bashahr survey for the year under report amounts to ₹13,975 against ₹15,946 in the previous year. The details are given in Appendix C.

Season's cost-rate.

51. The cost-rates of the season's work estimated on the area surveyed in detail are as follows:—

Topographical survey on the 4-inch scale, ₹59 per square mile.
„ „ 1-inch „ ₹10·5 „

The cost-rates for the previous two years were—

Topographical survey on the 4-inch scale, ₹53·3 and ₹62·1 per square mile.
„ „ 1-inch „ ₹13·7 and ₹12·2 „

CENTRAL PROVINCES.

Central Provinces surveys.

52. In the Central Provinces the Forest Survey Branch was employed in surveying, in continuation of the previous season's operations, the reserved forests in

the districts of Raipur, Bhandara and Mandla, and the survey of the forests in the Narsingpur and Balaghat Districts were commenced.

Surveys completed and new surveys started.

53. The survey of the forests in the Bhandara District and the Dhanwai Range in the Mandla District having been completed during the early part of the field season, the detachments working in these districts moved into the Narsingpur and Balaghat Districts and commenced the survey of the reserved forests in accordance with the orders contained in the correspondence ending with Inspector General of Forests' No. 828, dated 16th October 1891.

Expenditure.

54. The total expenditure incurred during the year by the Forest Survey Branch for surveys that were in progress in the districts of Raipur, Bhandara, Mandla, Narsingpur and Balaghat amounts to R31,958 compared with R30,194 in the previous year. The above figures include a sum of R108 for publishing maps of the Chanda forests. The details of the expenditure are given in Appendix C.

Area surveyed and average cost rate.

55. The aggregate outturn of topographical work in the Central Provinces on the 4-inch and 16-inch scales amounts to 562 square miles compared with 626 square miles completed during the previous year. The average cost of the entire season's work, including the 16-inch boundary surveys and the preparation of forest distribution and soil records, as well as the entire office charges for mapping, deduction of areas, etc., was R50 per square mile compared with a cost-rate of R47 during the previous year. The chief cause of there being a less return of topographical work during the year under report than in the previous year is due to the fact that two of the survey detachments had to move their field of operations into new districts in the middle of the field season, and the long marches that had to be undertaken and loss of time which occurred in commencing new work resulted in a less outturn of field work, and consequently the cost-rate of the work was slightly increased.

The cost of the triangulation in the Narsingpur District was R5 per square mile, and the traversing and spirit-levelling operations in the Raipur District cost R12 per linear mile.

Summary of field and office work.

56. A summary of the season's field work will be found in Appendix A, and and in Appendix B is given a summary of the original drawings under preparation during the year.

RAIPUR DISTRICT.

Raipur surveys

57. The surveys in the Raipur District were carried on in continuation of the previous season's operations, and the work was confined to the forests of the North Sihawa Range. The detachment, consisting of ten native surveyors, under the charge of Mr. J Marten, Sub-Assistant Superintendent, left Dehra-Dun on the 7th November, and field operations were commenced towards the end of the month, and the surveyors were in the field until the 21st June. Mr. Marten, in addition to checking the work of his native surveyors, did the greater part of the levelling and traversing that was requisite for the interior survey of the forests.

58. An area of 177 square miles was surveyed on the 4-inch scale, and 9 square miles were completed on the 16-inch scale against 193 and 48 square miles on the 4-inch and 16-inch scales, respectively, during the previous year. The country operated on was far more difficult than the tracts previously surveyed.

Areas surveyed.

In addition to the above, 25 linear miles of traversing was run and 106 miles of levelling was completed with a spirit-level. The levelling was necessary to afford heights in the heart of dense forests where it was not possible to fix the heights of points by triangulation.

59. A record was prepared for all forests surveyed detailing the distribution and density of forest growth as well as the classification of surface soils.

Forest soil tracings.

60. The topography was tested by running instrumental contours at prescribed vertical distances, and 146 linear miles of check line and 106 miles of levelling were run through the plane-table work, and the tests were satisfactory.

Tests applied to the work.

61. The Superintendent of Forest Surveys was in the Raipur District from the 23rd to the 28th January; he examined the accounts of the party and satisfied himself that the field work was being efficiently conducted.

Superintendent's inspection.

62. The progress of the survey is illustrated on the Raipur index map, and the details of the field work are recorded in Appendix A.

Raipur index map.

63. The total expenditure for the year on account of field and office work, including all charges, amounts to R10,609. The cost of the season's work estimated on the area plane-tabled, and including the 16-inch boundary surveys and preparation of the record of forest growth and classification of soils, etc., was R48·5 per square mile as compared with R38·9 in the previous year. The cost-rates for the year under report is somewhat higher than the cost-rate for 1891-92; this is due to the country operated on being of a more difficult and intricate nature than the tracts previously surveyed.

Cost.

64. During the early part of the season the entire establishment suffered from fever, and two of the native surveyors were so debilitated that their outturn of field work was much less than usual.

Health of establishment.

BHANDARA DISTRICT.

65. In Bhandara District the survey of the reserved forests was in continuation of the operations of the previous season. The tracts surveyed are situated partly in the Gaikhuri and partly in the Pauni Range and are separated by long distances which necessitated additional marching and resulted in loss of time.

Bhandara surveys.

The party under Mr. C. Litchfield, Sub-Assistant Superintendent, took the field on the 15th November and out-door work was continued till the 10th June. This detachment, after completing the survey of the Balaghat forests early in March, moved into the Balaghat District and continued to work there until the close of the field season.

66. An area of 80 square miles was topographically surveyed, 74 of which were on the 4-inch scale, and 6 square miles were done on the 16-inch scale. These figures cannot be compared with the figures of the previous year, as the survey detachment was employed in the Bhandara District for a part of the field season only.

Area topographically surveyed.

67. The usual record of distribution of forests and classification of soils were prepared as the topographical survey progressed.

Forest and soil record.

68. The tests that have hitherto been applied to the topographical work by running instrumental contours through it at fixed vertical intervals were again applied, and 12 linear miles of "partal" or check surveys were also run through the plane-table work.

Tests applied.

69. Most of the 16-inch boundary surveys have been compared with the Settlement records, but as the Settlement mapping of Bhandara was incomplete at the close of the field season, some of the forest boundaries could not be finally compared and passed.

Sixteen-inch boundary survey.

70. The Superintendent of Forest Surveys was in the Bhandara District from the 28th January to 5th February, and satisfied himself that the field work was being efficiently conducted.

Superintendent's inspection.

71. The progress of the field work is illustrated on the index map of the Bhandara District, and the details of the work are recorded in Appendix A.

Bhandara index map.

72. The cost of the field and office work for the season amounts to R3,126 and the total expenditure for the year was R4,318; the charges for the previous year were R9,977.

Cost.

The cost-rate of the season's work estimated on the area plane-tabled is R53·9 per square mile, which is higher than the previous season's rate owing to the tracts under survey being scattered over a very large area and also to the fact that the surveyors were obliged to take up the survey of a new district in the middle of the field season, which caused loss of time in marching from one district to the other and against which no return of field work could be shown.

BALAGHAT DISTRICT.

73. The survey of the reserved forests in the Balaghat District was taken up in accordance with the orders referred to in paragraph 53 of this report. The Bhandara detachment having completed the survey of the Bhandara reserved forests early in March, the party was ordered into the Balaghat District, and before the close of the month had commenced field operations in the Sonawani Range. The surveyors were in the field until the 10th of June.

Balaghat survey.

74. The area topographically surveyed on the 4-inch scale was 89 square miles; the forest boundaries on the 16-inch scale were not surveyed owing to the late date on which the surveyors entered the Balaghat District, but this

Area surveyed.

portion of the work will be taken in hand during the early part of the coming field season.

The usual forest distribution and soil records were prepared at the same time as the topographical survey was done.

Tests applied to the work.

75. To test the accuracy of the plane-tabling, 9 linear miles of "partal" or check surveys were run through the area topographically surveyed, but the instrumental contours have yet to be added to the work.

Index map illustrating progress of Balaghat Survey.

76. The progress of the survey is illustrated on the index map of the Balaghat District, and the details of the field work will be found in Appendix A.

Cost.

77. The cost of the field and office work for the season was R2,879, and the total expenditure incurred for the year on account of the Balaghat survey was R4,415.

The cost-rate of the season's work estimated on the area plane-tabled amounts to R49·6 per square mile.

The expenditure and cost-rate figures cannot be compared with figures of previous year, as this is the first year in which forest survey operations have been conducted in the Balaghat District, but the figures compare favourably with the cost-rate figures for surveys in other districts in the Central Provinces.

Health of the party.

78. During the early part of the field season, whilst the survey detachment was in the Bhandara District, the health of the establishment was all that could be desired, but later on, after the surveyors moved into the Balaghat forests, most of the men suffered from fever; one man died.

MANDLA DISTRICT.

Mandla surveys.

79. The survey of the forests of the Dhanwai Range in the Mandla District was carried out in continuation of the operations of the previous year. The survey detachment, under the charge of Mr. T. S. Marten, Extra Assistant Superintendent, took the field on the 8th November, and was employed upon out-door work until the 11th of June.

As there was insufficient work in the Dhanwai forests to occupy the full strength of the detachment throughout the field season, the surveyors were divided into two sections, one of which worked in the Mandla District and the second broke work in the Narsingpur District; but later in the season, after the survey of the Dhanwai forests was completed, the full strength of the detachment was employed in Narsingpur.

Area topographically surveyed.

80. In the Mandla District an area of 117 square miles was plane-tabled, of which 81 were on the 4-inch scale and 36 square miles were on the larger scale of 16 inches to the mile.

16-inch boundary surveys.

81. Two hundred and eighty-nine linear miles of forest boundary were surveyed for purposes of comparison with the settlment records, but as the Settlement survey of the villages touching on the Dhanwai forests was incomplete at the close of the field season, the necessary comparison could not be made.

82. For all forests surveyed during the season a record was prepared to illustrate the distribution and density of forests and the classifications of surface soils.

Record of forest growth and soils.

83. The topographical work was tested by running six linear miles of "partal" or check surveys through the plane-table sections in addition to running the usual instrumental contours at 250 feet vertical intervals.

Tests applied to the work.

84. The progress of the survey is illustrated on an index map of the Jubbulpore Division, and the details of the field work are given in Appendix A.

Index map illustrating progress of survey.

85. The expenditure on account of field and office work was R3,829, and the total expenditure for the year, including all charges, amounts to R5,920.

Cost.

The cost-rate of the season's work estimated on the area plane-tabled amounts to R50·6 per square mile compared with R66·1 for the previous year.

86. The establishment during the early part of the field season suffered a good deal from jungle fever, but when the hot weather set in the surveyors improved in health.

Health of the party.

NARSINGPUR DISTRICT.

87. The survey of the reserved forests in the Narsingpur District was taken in hand in accordance with the orders referred to in paragraph 53 of this report.

Narsingpur survey.

A small section of the Mandla survey detachment commenced field operations in the Narsingpur forests on the 20th November, and the surveyors were in the field till the 10th June. Operations were confined to the Bachai and Srinagar Ranges in the south-eastern corner of the district. The survey was under the immediate charge of Mr. T. S. Marten, who, in addition to checking the work of the native surveyors, also completed the triangulation requisite for the season's topographical work.

88. An area of 90 square miles was topographically surveyed, *viz.*, 61 square miles on the 4-inch scale and 29 square miles on the 16-inch scale.

Area topographically surveyed.

89. Triangulation was extended over an area of 274 square miles to afford stations and heights of points in the heart of the forests for the present season's work as well as in advance for the coming season's topographical operations.

Triangulation.

90. Thirteen linear miles of "partal" or check surveys were run through the area topographically surveyed as well as instrumental contour lines at fixed vertical intervals.

Tests applied to topographical work.

91. As the topographical survey progressed, a record was prepared illustrating the distribution and density of forests and the classification of soils.

Forest growth and soil records.

92. The Superintendent of Forest Surveys was in the Narsingpur District from the 5th to the 19th February and inspected the accounts of the Narsingpur and Mandla detachment; he answered all references that were brought before him, and satisfied himself that the field work was being carried out in accordance with orders laid down for the guidance of the officer in charge.

Superintendent's inspection.

93. The Narsingpur index map illustrating the progress of the survey and the details of the season's field work will be found in Appendix A.

Narsingpur index map.

94. The sum of R4,871 was expended on field and office work, and the total expenditure for the year, including all charges, amounts to R6,588.

Cost.

The cost-rate per square mile of area topographically surveyed was R57·9; the cost of the triangulation was R5 per square mile. This being the first year of the survey, it is not possible to compare the cost of the work with previous years; but the cost of similar work done by the same detachment in the Mandla District during the previous year was R66·1.

95. The Narsingpur forests are reported to be very unhealthy, and during the latter part of the field season the surveyors suffered a good deal from fever and dysentery.

Health of the party.

NORTH-WESTERN PROVINCES AND OUDH.

96. In the correspondence ending with Inspector General of Forests' No. 482, dated 29th June 1892, the survey of the reserved forests in Oudh was ordered; accordingly a detachment of the Forest Survey Branch was organized to commence the requisite survey. The survey detachment left Dehra on the 7th November, and field operations were taken in hand by the middle of the month, and the field parties were out until the 5th of June.

Oudh surveys.

The tracts operated on were the forests in the Pilibhit District, which were completed by the 5th April, and the Bhira forests in the Kheri District.

97. Mr. W. H. Reynolds, Superintendent of Forest Surveys, personally supervised the starting of the work. He was with the Oudh Party from the 1st to 6th December, and after the preliminaries were settled, the surveyors fully equipped, and the survey fairly started, the supervision of the work was left in the hands of an experienced and trustworthy native surveyor.

Supervision.

98. The traversing of the Oudh Revenue Survey (data of which were obtained from the Surveyor General's Office) was utilized as a basis for the topographical survey. The masonry trijunction pillars, which are fairly numerous, were used by the plane-tablers as initial and closing stations, and wherever it was found that the pillars were too far apart, additional traversing was run to supplement the points obtained from the Revenue Survey data; 192 linear miles of traversing was done with theodolite and two chains of unequal lengths. It was not considered necessary to do any triangulation, as the country under survey is practically flat.

Traversing.

99. An area of 251 square miles was surveyed topographically on the 4-inch scale, of which 153 square miles are in the Pilibhit Division and 98 square miles are forest tracts of Bhira in the Kheri Division.

Area topographically surveyed.

100. On completion of the survey, 116 linear miles of "partal" or check surveys were run through the area operated on, and the work stood the test well.

Tests applied to the work.

101. Mr. W. H. Reynolds, the Superintendent, again visited the Oudh Survey Party in April, and scrutinized the field sheets and traverse field books of the several surveyors, and was satisfied that the field work was being efficiently executed.

Superintendent's inspection.

102. The progress of the work is illustrated on the index map of Kheri and Pilibhit Districts, and the details of the season's field work are given in Appendix A.

Index map of Kheri and Pilibhit.

103. The amount expended on field and office work was R2,936, and the total expenditure for the year for the forest surveys executed in the Pilibhit and Kheri Districts, including all charges, amounts to R4,956. Of this amount R3,125 are chargeable to the Pilibhit Division and R1,831 to the Bhira Sub-Division of Kheri.

Total cost.

104. The cost-rate per square mile of area topographically surveyed on the 4-inch scale was for the forests in the Pilibhit District R18·6, and for the Bhira forests R17·3.

Cost-rate per square mile.

The cost of the traversing in the Pilibhit District was R2·3, and in Bhira R1·7 per linear mile.

The above cost-rates are comparatively low; this is chiefly due to the fact that the tracts surveyed during the year under report were exceptionally easy to operate in and the details to be surveyed were comparatively few.

105. Throughout the field season the health of the Oudh Survey Party was all that could be desired.

Health of the party.

ASSAM.

106. The survey of the forests in the Goalpara District were in continuation of the operations of the previous year. The detachment under the charge of Mr. E. Litchfield, Assistant Superintendent, took the field early in December and continued to do out-door work till the beginning of June. The tracts surveyed were very much scattered, and comprised portions of the eastern, western, and Guma Ranges.

Goalpara surveys.

107. The area topographically surveyed on the 4-inch scale was 126 square miles; this is less than the previous year's outturn, and is due to the fact that fewer surveyors were employed upon the work than during the field season of 1891-92.

Area topographically surveyed.

108. At the same time as the topographical survey progressed, the same surveyors prepared a record of the distribution and density of forests.

Forest growth record.

Traversing.

109. Chiefly for purposes of connecting the $\frac{\text{Bhutan}}{\text{Goalpara}}$ boundary pillars with the triangulation of the country, 41 linear miles of theodolite traversing was run, and a length of 52 miles of frontier boundary was thereby determined.

Triangulation.

110. A few observations were taken to fix 5 or 6 trigonometrical points and to determine a few additional heights, and for which no area can be given, as the tract in which these points fall was reported in the area triangulated last year.

Tests applied to the work.

111. Check or "partal" lines amounting to 183 linear miles were run through the area topographically surveyed; this disclosed some omissions as well as inaccuracy in the topographical details, and it resulted in the re-survey of an area of 31½ square miles. The surveyor who was chiefly at fault was dismissed.

Superintendent's visit to field party.

112. The Superintendent of Forest Surveys was in the Goalpara District from the 16th to the 24th of April, and examined and inspected the accounts and field sheets of the party, and dealt with all references that were brought before him.

Index map illustrating progress.

113. The index map of the Goalpara District illustrates the progress of the work, and from which it will be seen that the field work connected with the forests in this district is now completed.

Health of the establishment.

114. From the middle of March onwards the establishment suffered a great deal from fever and other diseases; two men died and three absconded. Mr. Litchfield himself suffered from an attack of malarial fever, the effects of which he had not quite recovered from on his return to head-quarters.

Cost.

115. The amount expended on field and office work was R10,817, and the total expenditure for the year incurred on account of the Goalpara Forest Surveys, including all charges, amounted to R16,352 as against R19,240 in the year previous.

Cost-rate per square mile.

116. The topographical work on the 4-inch scale, estimated on the area plane-tabled (and including the preparation of the records of distribution and density of forests and the classification of soils), cost R89·9 per square mile compared with a cost-rate of R42·3 per square mile in the previous year.

The traversing and fixing of the pillars on the Bhutan frontier boundary cost R53·9 per linear mile.

The cost-rate of the season's topographical work is exceedingly high when compared with the cost-rate of similar work done last year; this is accounted for partly from the tracts under survey being scattered over a very extensive area, which made it more costly to provision the camps, and also to the fact that the greater part of the large area surveyed in the previous year had to be checked in detail during the year under report (*vide* paragraph 52 of last year's report). The checking of last year's topographical work as well as the present season's plane-tabling necessitated the running of 182½ linear miles of "partal" lines, and occupied several of the best surveyors for a considerable time.

Against this work no area can be returned, and hence this tended to swell the cost-rate of the area operated on.

Difficulties encountered in survey of Goalpara forests.

117. Regarding the difficulties that have been encountered in the country that has been surveyed by the Goalpara Forest Survey detachment, Mr. Litchfield reports as follows :—

"The survey of the Goalpara forests has been a most difficult and troublesome undertaking. The absence of labour and supplies on the spot, the want of roads, the difficulty of transport, the dark densely-growing forests with thickly matted undergrowth, the impenetrable grass 15 to 25 feet high, the opaque haze during the dry months, the excessive rain beginning at the end of March, when the whole country is flooded, the unhealthy malarial nature of the country, and the distance of the trigonometrical stations on the Brahmaputra (on which the Forest survey is based) from the Forest Survey stations on the Bhutan hills without any intervening hills or high ground suitable for connecting stations,—all combined to add to the difficulty of surveying a naturally difficult, uninhabited and trackless area. On the Bhutan boundary the average rate of progress on the march was less than a mile an hour. Rice, ghee, dal, etc., were purchased at Dhubri, carried 50 miles to Koohugaon, and stored there for distribution. Each camp was obliged to provide itself with a week's supply at a time, and in my own case I was obliged to carry, in addition, a supply of grain for the elephants. This did not leave much room for the very limited quantity of baggage and stores I carried for myself. But mutton, vegetables, milk and flour are not to be had; and all ordinary stores must be imported from Calcutta."

Bhutan boundary.

118. The demarcation and survey of the frontier boundary between Bhutan and the Goalpara District was completed during the year under report. The boundary line is about 88 miles in length, and is demarcated by 29 pillars numbered consecutively from 50 to 78, which are the same numbers as were assigned to them when the boundary was originally demarcated.

According to the wishes of the Chief Commissioner, the boundary line was followed out by Mr. Litchfield in company with the Deputy Commissioner of Goalpara, and the boundary-marks were shown and made over to the latter officer, who is answerable and responsible that suitable pillars are erected and maintained. In his No. 608, dated 20th February, to the Chief Commissioner, the Deputy Commissioner has given a description of each pillar from notes taken on the spot, and further information will be found in Appendix E of this report.

Difference between old and new survey.

119. Although the topographical details surveyed by the Forest Survey along the Bhutan boundary agree fairly well with the details shown on the old Revenue Survey maps, yet the geographical position of the entire length of the boundary, as shown by the new survey, falls on an average about quarter of a mile farther north of that assigned to it on the old maps. This no doubt is due to the fact that the positions of the pillars as determined by the Forest Surveys were fixed trigonometrically, whereas the old values were the results of traversing only.

BURMA.

Burma surveys.

120. During the year under report, two detachments of the Forest Survey Branch were employed in Burma, *viz.*, one in the Tenasserim Circle of Lower Burma and the second in the Pyinmana District of Upper Burma.

The survey of the Pyinmana forests was taken up in accordance with the correspondence ending with the Inspector General of Forests' No. 402, dated the 11th June 1893.

121. An area of 101 square miles was topographically surveyed, 88 square miles of which were done on the 4-inch scale and the balance on the 2-inch scale. Triangulation was extended over an area of 319 square miles, and 450 square miles of traversing were completed.

Area surveyed.

122. The total expenditure for the year incurred by the Forest Survey Branch for surveys in Burma amounts to to R32,906, of which R14,251 are debitable to the Tenasserim Circle and R18,655 to Upper Burma. The details of the figures are recorded in Appendix C.

Expenditure.

123. In Appendix A will be found a summary of the field work and computations, and in Appendix B is given a summary of the original drawings under preparation.

Summary of field and office work.

SALWEEN DIVISION.

(LOWER BURMA.)

124. The survey of the forests in the Salween Division was in continuation of the previous seasons operations. The Survey detachment took the field early in December, and topographical work was carried on in the forests of the Toungyin valley until the end of March, when it was reported that, with the exception of two surveyors and a few khallasies, the whole of the party had utterly broken down through fever and dysentery, and consequently the field season was brought to a close early in April.

Salween surveys.

125. The supervision of the field party was in the hands of Mr. T. A. Hauxwell, Deputy Conservator of Forests, who appears to have carried out all that was expected of him.

Charge of party.

126. The following areas, amounting to 111 square miles, were topographically surveyed :—

Area topographically surveyed.

(i.)	Demarcated forests on the	4-inch scale	88 square miles
(ii.)	Thoungyin river and main roads between forests on the	4-inch scale	16 ,,
(iii.)	Ditto . Ditto on the	2-inch scale	7 ,,

127. Triangulation was extended over an area of 319 square miles to provide stations for the following season's topographical work.

Triangulation.

128. The plane-table work was checked by running 30 linear miles of "partal" lines through it, and it proved to be satisfactory.

Tests applied to the plane-table work.

129. Mr. W. H. Reynolds, the Superintendent of Forest Surveys, visited the field party during the early part of January and satisfied himself that the survey was progressing satisfactorily.

Superintendent's inspection.

130. The index map of the Tenasserim Circle illustrates the progress of the survey, and the details of the season's field work are given in Appendix A.

Index map illustrating progress.

131. The expenditure on account of field and office work was R7,067, and the total expenditure for the year on account of the Tenasserim Forest Survey, including all charges, amounts to R14,251.

Expenditure.

132. The cost-rate of the topographical survey on the 4-inch scale estimated on the area plane-tabled comes to R81·7 per square mile as compared with R86 per square mile in the previous year. The season's triangulation cost R16 per square mile.

Cost-rate per square mile.

133. The health of the triangulation party remained good throughout the season, but the plane-table surveyors suffered a good deal from fever and dysentery, and at the end of March the majority of the men utterly broke down and had to close work for the season.

Health of the establishment.

PYINMANA DISTRICT.

(UPPER BURMA.)

134. The survey of the forests in the Pyinmana District was undertaken in accordance with the orders referred to in paragraph 120 of this report.

Pyinmana survey.

The field party under the charge of Mr. J. H. Nichol arrived in the Pyinmana District on the 3rd November, and survey operations were continued until the end of May.

At the commencement of the field season, owing to the surveyors being new to the country, many difficulties presented themselves; but as the season advanced and the establishment became better acquainted with the district, most of the difficulties (with the help of the local Forest officials) were overcome and a fairly satisfactory outturn of traversing was completed.

135. Nothing beyond the preliminary work of traversing and triangulation, as a basis for the topographical survey, was attempted. Four hundred and seven linear miles of theodolite traversing was run over an approximate area of 450 square miles. All pillars along the forest boundaries were taken up as traverse stations, and hence these pillars will now serve the purposes of *permanent* survey marks.

Area surveyed.

136. During the early part of the field season Mr. Nichol devoted much of his time to selecting points for trigonometrical stations, but later on he was unable to complete his observations, as it became too hazy to allow of the survey signals being distinguished, and the result is that no area can be returned for this unfinished work.

Triangulation.

The triangulation, however, will be continued during the coming field season, and the tracts previously operated on will be included in the areas reported in the next annual progress report.

137. All the traversing that has been done to date has been computed, and the results are satisfactory.

Computations.

The plane-table sections have also been plotted in readiness for the coming field season.

Index map illustrating progress.

138. The index map of the Pyinmana District illustrates the progress of the survey.

Supervision.

139. The general supervision of the field work rested with Mr. Muriel, Deputy Conservator of Forests, and he appears to have done all that was required of him in a satisfactory manner.

Expenditure.

140. The cost of the field and office work for the year was R10,726, and the total expenditure, including all charges on account of the forest surveys in the Pyinmana District, amounts to R18,655.

Cost-rates per square mile.

141. The cost of the season's traversing, estimated on the area within which this branch of the work was confined, was R36·3 per square mile as compared with a cost of R31·4 in Lower Burma during the previous year.

A sum of R2,283 was expended on triangulation, but as no area can be returned for this branch of the work, the amount will be added to the expenditure on account of triangulation in the coming field season when estimating the cost-rate of this branch of the Survey.

Superintendent's visit to field party.

142. Mr. W. H. Reynolds, Superintendent of Forest Surveys, was with the Pyinmana field party from the 14th to the 28th December.

Health of the establishment.

143. Throughout the field season the party suffered a good deal from fever.

OFFICERS OF THE SUPERIOR STAFF.

Mr. W. H. Reynolds, Superintendent of Forest Surveys.

144. Mr. W. H. Reynolds was in charge of the Forest Survey Branch throughout the year. He left head-quarters on the 29th November and proceeded to the Pilibhit District in Oudh to see the new surveys in that province fairly started, after which he proceeded to Upper Burma to arrange for the carrying out of the new surveys in the Pyinmana District, and remained with that party from the 14th to the 28th December; he then proceeded to Moulmein and visited the Survey party working in the forests on the Siam frontier in the Tenasserim Circle; he was there until the 12th January, and then went to the Central Provinces. From the 23rd to 28th January Mr. Reynolds was in the Raipur District, and after doing all that was necessary for this detachment, he visited the party working in the Bhandara District and was in this district until the 5th February, when he proceeded to Narsingpur to inspect the field party working in that district; and he was in the Narsingpur District until the 19th February, after which he proceeded to Dehra-Dun to dispose of pressing work at the head-quarters office and to assist in the examinations of the students at the Forest School. From the 22nd February to the 6th April Mr. Reynolds was at his head-quarters office, and on the 7th April he proceeded to Oudh to pay a second visit to the field party working in the districts of Pilibhit and Kheri, and was there up to the 14th April; from thence he proceeded to Assam and inspected the field sheets and computations of the Goalpara party. Mr. Reynolds was in the Goalpara District from the 16th to the 24th April and then returned to the head-quarters office at Dehra Dun. From early in June till the 6th uly the Superintendent was in Bashahr, supervising the survey work in the

Himalayas; he returned to Dehra-Dun on the 8th July and remained at head-quarters up the close of the survey year.

Mr. E. Litchfield, Assistant Superintendent, Forest Surveys.

145. Mr. E Litchfield, Assistant Superintendent, Forest Surveys, was in charge of the Goalpara Survey detachment during the field season. He left Dehra on the 24th November and was in the Goalpara District up to the 11th June, and returned to head-quarters on the 16th June. He was employed on the demarcation of the Bhutan–Goalpara boundary and in completing the topographical survey of the sâl forests of the Goalpara District in Assam. He was at the head-quarters office from the 16th June to the 5th August completing his field papers, and he then went to Bashahr to take up the 1-inch survey of the northern part of the State and to supervise the survey work that was in progress in the Upper Sutlej valley, and was in the field at the close of the survey year.

Mr. Litchfield's work in Bashahr is most satisfactory. He succeeded in turning out a large area of 1-inch work, and his Bashahr field sheets show ample topographical details and are well drawn.

Mr. T. A. Hauxwell, Deputy Conservator of Forests.

146. Mr. Hauxwell, during the field season, supervised the field work of the Tenasserim party, and he deserves much credit for his most excellent arrangements in provisioning the several camps and providing coolie labor in an almost uninhabited and trackless part of the country.

Mr. C. E. Muriel, Deputy Conservator of Forests.

147. Mr. C. E. Muriel was directed, under the orders of the Chief Commissioner, to supervise the survey work in the Pyinmana District. He examined the field books of the traverse surveyors as the work progressed, and visited the survey camps whenever opportunities offered, and did all that was expected of him in connection with the survey satisfactorily.

OFFICERS OF THE JUNIOR DIVISION.

Mr. T. S. Marten, Extra Assistant Superintendent.

148. Mr. T. S. Marten was in charge of the Mandla and Narsingpur Forest Survey detachments during the field season. He took the field on the 8th of November and did not return to head-quarters until the 14th June. In addition to supervising the field work of his detachment, he completed some triangulation in the Narsingpur District. During the recess season he was employed on bringing up the details of the work connected with the Narsingpur and Mandla surveys, and he also did the drawing of a portion of 1-inch standard sheet No. 353 of Bashahr. Mr. Marten is an experienced surveyor and handles his native establishment well, and is energetic in the field; but the details of his office work are not always done as carefully as they might be.

Mr. James Marten, Sub-Assistant Superintendent.

149. From the 7th November to the 11th July, Mr. J. Marten was in charge of the field detachment working in the Raipur District; he returned to head-quarters on the 14th July. In addition to supervising the surveyors employed on topographical work, Mr. Marten did some traversing as well as spirit-levelling. During the recess months he was employed on bringing up the office work connected with his field party and in examining and completing fair sheets for the press. Mr. Marten has applied himself well to his duties and

has worked zealously; he is particularly good at training natives in surveying and in handling them in the field.

Mr. J. H. Nichol, Sub-Assistant Superintendent.

150. Mr. Nichol proceeded to Upper Burma on the 24th October with the Pyinmana detachment and held charge of it until the 16th June, when he returned to head-quarters. During the early part of the field season, and whilst his surveyors were traversing the forest boundaries, he was employed in selecting trigonometrical stations and planning the season's triangulation; but later on, when he found the season had too far advanced for triangulation, he devoted himself only to completing main circuit traverses. He had many difficulties to contend against in Burma; nevertheless he succeeded in turning out a satisfactory amount of traversing. He was occupied during the recess months in computing the Burma and other traversing, and did his work steadily and well.

Mr. C. Litchfield, Sub-Assistant Superintendent.

151. Mr. C. Litchfield took the field with the Bhandara detachment on the 15th November and was in charge of the party until the 13th July, when he returned to head-quarters. During the early part of the field season he was engaged in the Bhandara District; but on completing the survey of the Bhandara forests in March, he proceeded to the Balaghat District with his detachment and continued to work there until the 13th July. Mr. Litchfield was at the head-quarters office from the 11th July to the 5th August, bringing up the papers connected with his field work, after which he proceeded to Bashahr, and was engaged on the 1-inch survey of that State until the close of the survey year. Mr. Litchfield continues to exhibit zeal and energy in the performance of his duties, and his outturn of 1-inch work in Bashahr is very creditable to him.

Mr. A. Descubes.

152. Mr. Descubes has been engaged throughout the year in the head-quarters office, except for the period he was on privilege leave from 3rd July to 3rd September. He was employed chiefly in preparing special drawings and in finishing and examining the fair drawings of standard sheets of the several Forest Survey parties, as well as the supervision of the deductions of forest areas; he also at the same time continued to post up the provincial forest map records and did a considerable amount of very useful miscellaneous work.

Mr. Descubes is a most able, zealous and hard-working assistant; he is devoted to his work and is always most willing to perform any work allotted to him, however arduous; much credit is due to him for the amount of good and useful work he has done during the year, and he is certainly deserving of a better and higher paid appointment than the one he at present holds.

NATIVE SURVEYORS.

Strength of native establishment.

153. The average strength of the native establishment employed during the field season on each branch of work was—

Triangulation	1
Traversing	12
Plotting and computing	8
Plane-tabling	56
In the field	77
At head-quarters	33
TOTAL	110

154. On the whole the native establishment, both in the field and in office, worked exceedingly well, and the following are specially deserving of notice, *viz.*, Kali Kant Kar, Salig Ram, Tulsi Ram, Badvi Dutt, Bhoop Sing, Oodey Sing, Jadu Nath Nath, and Suban Lal.

Services of native establishment.

155. The following statements are appended to this Report;—

Documents accompanying the Report.

I. Appendix A.—Summary of outturn of field work and computation.

II. Appendix B.—Summary of outturn of drawing and miscellaneous work.

III. Appendix C.—Summary of expenditure from 1st October 1892 to 30th September 1893, showing the amount expended on field and office work.

IV. Appendix D.—Area topographically surveyed by the Forest Survey Branch during 1892-93.

V. Appendix E.—List and description of pillars on the Goalpara Bhutan boundary, Assam.

VI. Annual Form No. 61.—Summary of revenue and expenditure for the Forest year 1892-93 (Imperial).

VII. Annual Form No. 61.—Summary of expenditure for the Forest year 1892-93.

VIII. Annual Form No. 62.—Account current for the Forest year 1892 93.

IX. Annual Form No. 64.—Outstandings and liabilities on account of Contractors and Disbursers for the Forest year 1892-93.

W. H. REYNOLDS,
Superintendent, Forest Surveys.

DEHRA-DUN,
The 5th December 1893.

APPENDIX A

Summary of Outturn of Field Work and Computations by the Forest Survey Department from 1st October 1892 to 30th September 1893.

No.	Punjab, Central Provinces, Assam, Burma and North-Western Provinces and Oudh Surveys.		Amount.	Remarks.
	Plane-tabling.			
1	Area plane-tabled on the scale of 4″=1 mile—			
	(*a*) Bashahr—Punjab	124		
	(*b*) Mandla—Central Provinces	81		
	(*c*) Narsingpur ,,	61		
	(*d*) Raipur ,,	177		
	(*e*) Bhandara ,,	74		
	(*f*) Balaghat ,,	89		
	(*g*) Pilibhit—Oudh	153		
	(*h*) Bhira ,,	98		
	(*i*) Goalpara—Assam	*126		* Includes revised survey of 31½ square miles.
	(*j*) Tenasserim Circle—Burma	104		
		1,087		
			1,804	square miles.
	Area plane-tabled on the scale of 1″=1 mile—			
	Bashahr—Punjab	630		
	Area plane-tabled on the scale of 16″=1 mile—			
	(*a*) Mandla—Central Provinces	36		
	(*b*) Narsingpur ,,	29		
	(*c*) Raipur ,,	9		
	(*d*) Bhandara ,,	6		
		80		
	Area plane-tabled on the scale of 2″=1 mile—			
	Tenasserim—Burma	7		

No.	Punjab, Central Provinces, Assam, Burma and North-Western Provinces and Oudh Surveys.		Amount.	Remarks.
2	Boundary surveyed on 16″ scale (linear)—			
	(*a*) Mandla—Central Provinces . .	289		
	(*b*) Narsingpur „ . . .	227		
	(*c*) Raipur „ . . .	88		
	(*d*) Bhandara „ . . .	84		
		688	810	
3	Boundary surveyed on 4″ scale (linear)—			
	(*a*) Bhutan Goalpara—Assam	52		
	(*b*) Tenasserim Circle—Burma . . .	70		
		122		
4	Number of boundary pillars fixed—			
	Goalpara—Assam	119	119	
5	Number of plane-table stations in area surveyed—			
	(*a*) Bashahr—Punjab	5,794		
	(*b*) Mandla—Central Provinces . . .	13,763		
	(*c*) Narsingpur „ . . .	14,527		
	(*d*) Raipur „ . . .	28,819		
	(*e*) Bhandara „ . . .	13,988	1,42,059	
	(*f*) Balaghat „ . . .	21,105		
	(*g*) Pilibhit—Oudh	13,452		
	(*h*) Bhira „	6,656		
	(*i*) Goalpara—Assam	8,426		
	(*j*) Tenasserim Circle—Burma . . .	16,429		
6	Number of plane-table stations for testing work—			
	(*a*) Bashahr—Punjab	228		
	(*b*) Mandla—Central Provinces . . .	754		
	(*c*) Narsingpur „ . . .	610		
	(*d*) Raipur „ . . .	5,699		
	(*e*) Bhandara „ . . .	573		
	(*f*) Balaghat „ . . .	330	14,373	
	(*g*) Pilibhit—Oudh	748		
	(*h*) Bhira „	845		
	(*i*) Goalpara—Assam	3,420		
	(*j*) Tenasserim Circle—Burma . . .	1,166		

No.	Punjab, Central Provinces, Assam, Burma and North-Western Provinces and Oudh Surveys.		Amount.	Remarks.
	Triangulation.			
7	Area triangulated—			
	(*a*) Bashahr—Punjab	30	623	square miles.
	(*b*) Narsingpur—Central Provinces	274		
	(*c*) Tenasserim Circle—Burma	319		
8	Number of Theodolite stations—			
	(*a*) Bashahr—Punjab	11	55	
	(*b*) Narsingpur—Central Provinces	18		
	(*c*) Tenasserim Circle—Burma	31		
9	Number of points fixed—			
	(*a*) Bashahr—Punjab	28	167	
	(*b*) Narsingpur—Central Provinces	41		
	(*c*) Tenasserim Circle—Burma	98		
	Traversing.			
10	Area traversed—			
	(*a*) Raipur—Central Provinces	18	636	square miles.
	(*b*) Pilibhit—Oudh	94		
	(*c*) Bhira „	74		
	(*d*) Pyinmana—Burma	450		
11	Number of linear miles traversed—			
	(*a*) Raipur—Central Provinces	25	665	
	(*b*) Pilibhit—Oudh	118		
	(*c*) Bhira „	74		
	(*d*) Goalpara—Assam	41		
	(*e*) Pyinmana—Burma	407		
12	Number of Traverse stations—			
	(*a*) Raipur—Central Provinces	320	9,291	
	(*b*) Pilibhit—Oudh	730		
	(*c*) Bhira—Oudh	450		
	(*d*) Goalpara—Assam	713		
	(*e*) Pyinmana—Burma	7,078		

No.	Punjab, Central Provinces, Assam, Burma and North-Western Provinces and Oudh Survey.		Amount.	Remarks.
13	Connection of traverses with Trigonometrical stations—			
	Tenas-serim Circle—Burma . . .	12	12	
14	Check Surveys or "Partals"—			
	(*a*) Mandla—Central Provinces . .	6		
	(*b*) Narsingpur „ . .	13		
	(*c*) Raipur „ . .	146		
	(*d*) Bhandara „ . .	12		
	(*e*) Balaghat „ . .	9		
	(*f*) Pilibhit—Oudh	68	562	miles.
	(*g*) Bhira „	50		
	(*h*) Goalpara—Assam	183		
	(*i*) Tenasserim Circle—Burma . .	30		
	(*j*) Bashahr—Punjáb	47		
15	Levelling—			
	Raipur—Central Provinces . . .	106	106	linear miles.
16	Number of Levelling stations—			
	Raipur—Central Provinces . . .	1,806	1,806	
	Computations.			
17	Number of linear miles of traversing—			
	(*a*) Pilibhit—Oudh	84		
	(*b*) Bhira „	44		
	(*c*) Goalpara—Assam	*320	795	* 278 revised.
	(*d*) Tenasserim Circle—Burma . .	59		
	(*e*) Pyinmana „ . . .	288		
18	Number of Traverse stations in duplicate—			
	(*a*) Pilibhit—Oudh	564		
	(*b*) Bhira— „	257		
	(*c*) Goalpara—Assam	2,874†	10,261	† 1,707 revised.
	(*d*) Tenasserim Circle—Burma . . .	1,344		
	(*e*) Pyinmana— „ . . .	5,722		

No.	Punjab, Central Provinces, Assam, Burma, and North-Western Provinces and Oudh Surveys.		Amount.	Remarks.
19	Number of triangles in duplicate—			
	(a) Bashahr—Punjab	366		
	(b) Narsingpur—Central Provinces . . .	36		
	(c) Goalpara—Assam	236*	940	* Revised.
	(d) Tenasserim Circle—Burma . . .	297		
	(e) Pyinmana— „	5		
20	Number of points fixed thereby, and of which the rectangular co-ordinates have been computed in duplicate—			
	(a) Bashahr—Punjab	156		
	(b) Narsingpur—Central Provinces . .	20		
	(c) Goalpara—Assam	132†	486	† 127 revised.
	(d) Tenasserim Circle—Burma . . .	173		
	(e) Pyinmana „	5		
21	Number of triangles worked in duplicate to determine heights—			
	(a) Bashahr—Punjab	294		
	(b) Narsingpur—Central Provinces . .	38		
	(c) Goalpara—Assam	244‡	892	‡ 234 revised.
	(d) Tenasserim Circle—Burma . . .	310		
	(e) Pyinmana— „	6		
22	Number of points of which the heights were determined—			
	(a) Bashahr—Punjab	147		
	(b) Narsingpur—Central Provinces . .	19		
	(c) Goalpara—Assam	122§	449	§ 117 revised.
	(d) Tenasserim Circle—Burma . . .	158		
	(e) Pyinmana— „	3		
23	Abstract of horizontal angles in duplicate—			
	(a) Bashahr—Punjab	1,058		
	(b) Narsingpur—Central Provinces . .	104		
	(c) Goalpara—Assam	11	1,668	
	(d) Tenasserim Circle—Burma . . .	458		
	(e) Pyinmana— „	37		

No.	Punjab, Central Provinces, Assam, Burma, and North-Western Provinces and Oudh Surveys.		Amount.	Remarks.
24	Number of spherical co-ordinates converted to rectangular co-ordinates in duplicate (Trigonometrical stations and corners of sheets, etc.)—			
	(*a*) Jubbulpur—Central Provinces	42		
	(*b*) Mandla „	33		
	(*c*) Narsingpur „	74		
	(*d*) Bhandara „	9		
	(*e*) Balaghat „	124		
	(*f*) Nagpur „	18		
	(*g*) Seoni and Chindwara—Central Provinces	75	762	
	(*h*) Pilibhit—Oudh	86		
	(*i*) Bhira— „	36		
	(*j*) Tenasserim Circle—Burma	33		
	(*k*) Pyinmana— „	104		
	(*l*) Kumaun and Garhwal—North-Western Provinces	128		
25	Number of Revenue Survey co-ordinates converted to terms of Forest Survey origin—			
	(*a*) Saugor—Central Provinces	1,304		
	(*b*) Seoni „	2,531	8,547	
	(*c*) Chindwara— „	2,432		
	(*d*) Nagpur „	2,280		
26	Number of tangent scale clinometers' observations—			
	(*a*) Bashahr—Punjab	28		
	(*b*) Mandla—Central Provinces	465		
	(*c*) Narsingpur „	301	1,770	
	(*d*) Bhandara „	687		
	(*e*) Goalpara—Assam	159		
	(*f*) Tenasserim Circle—Burma	130		
27	Number of heights determined by tangent scale clinometers—			
	(*a*) Bashahr—Punjab	36		
	(*b*) Mandla—Central Provinces	225		
	(*c*) Narsingpur „	146	1,014	
	(*d*) Bhandara „	396		
	(*e*) Goalpara—Assam	127		
	(*f*) Tenasserim Circle—Burma	84		

No.	Punjab, Central Provinces, Assam, Burma, and North-Western Provinces and Oudh Surveys.	Amount.	Remarks.
	Areas.		
	Map of the Government Forests in the Bashahr State, Punjab, scale 4″ = 1 mile.	11	sheets.
	Map of the Government Forests in the Jubbulpur Division, Central Provinces, scale 4″ = 1 mile.	50	sheets.
	Map of the Government Forests in the District of Raipur, Central Provinces, scale 4″ = 1 mile.	17	sheets.
	Map of the Government Forests in the District of Bhandara, Central Provinces, scale 4″ = 1 mile.	16	sheets.
	Map of the Government Forests in the District of Goalpara, Assam, scale 4″ = 1 mile.	23	sheets.
	Map of the Government Forests in Kumaun and Garhwal, showing blocks and compartments for working-plans, scale 4″ = 1 mile.	16	sheets.
	Index map of Kumaun and Garhwal, showing working-plan blocks and compartments, scale 1″ = 4 mile, with area statement of each block.	1	sheet.

APPENDIX B.

Summary of Outturn of Drawing executed by the Forest Survey Branch from 1st October 1892 to 30th September 1893.

No.	Particulars.	Number of sheets.	Remarks.
	Original Drawings.		
	North-Western Provinces and Oudh.		
	Central Circle.		
1	Kumaun and Garhwal, sheet No. LIII (2nd edition), scale 4″ = 1 mile (published).	1	
2	Kumaun and Garhwal, sheets Nos. LIIIA and LIVA, scale 4″ = 1 mile (published).	2	
	School Circle.		
3	Map of the Government Forests of Teri-Garhwal in Jaunsar, sheets Nos. $333\frac{S.\,E.}{2}$, $348\frac{S.\,W.}{1}$, scale 4″ = 1 mile (published).	2	
4	Map of the Kuramba block, part of Kuramba Forest in Jaunsar, sheets Nos. 223 (Punjab) and 227 (North-Western Provinces and Oudh), scale 4″ = 1 mile (published).	1	
5	Map of the Luchiwala Coppice, Working Circle, Dehra-Dun, scale 4″ = 1 mile (published).	1	
6	Map of the Government Forests of Teri-Garhwal in Jaunsar, sheets Nos. $333^{*}\frac{N.\,E.}{4}$, $348\frac{N.\,W.}{3}$, scale 4″ = 1 mile (in progress).	2	
	Oudh Circle.		
7	Index map to the Forest Survey in the Kheri and Pilibhit Districts, scale 8 miles = 1″ (published).	1	
8	Map of the Government Forests in the Pilibhit District, sheets Nos. $82\frac{N.\,E.}{2\text{ and }4}$, $82\frac{S.\,E.}{2}$ and $98\frac{S.\,W.}{1}$, $82\frac{S.\,E.}{4}$ and $98\frac{S.\,W.}{3}$, $97\frac{S.\,W.}{3}$, $98\frac{N.\,W.}{1}$, $98\frac{N.\,W.}{2}$, $98\frac{N.\,W.}{3}$, $98\frac{N.\,W.}{4}$, $98\frac{S.\,W.}{2}$ and $\frac{S.\,E.}{1}$, $98\frac{S.\,E.}{3}$, and $99\frac{N.\,E.}{1}$, scale 4″ = 1 mile (in progress).	10	
9	Map of the Government Forests in the Bhira Sub-Division of the District Kheri, sheets Nos. $99\frac{S.\,E.}{4}$, $100\frac{N.\,E.}{2}$, $100\frac{N.\,E.}{4}$, $114\frac{S.\,W.}{3}$, $115\frac{N.\,W.}{1}$, scale 4″ = 1 mile (in progress).	5	
	Punjab.		
10	Map of the Government Forests in the District of Simla, Bashahr State, sheets Nos. $332\frac{S.\,W.}{1}$, $332\frac{S.\,W.}{4}$, $332\frac{S.\,E.}{3}$, $333\frac{N.\,W.}{1}$, $346\frac{N.\,E.}{4}$, $346\frac{S.\,E.}{2}$, scale 4″ = 1 mile (published).	6	
11	Map of the Government Forests in the District of Simla, Bashahr State, sheets Nos. $347\frac{N.\,W.}{1}$, $347\dagger\frac{N.\,W.}{4}$, $347\dagger\frac{N.\,E.}{3}$, $347\dagger\frac{N.\,E.}{4}$, scale 4″ = 1 mile (sent to press).	4	

* Reported in 1890-91 as being in progress.
† Preliminary edition or Blue prints received.

No.	Particulars.	Number of sheets.	Remarks.
12	Map of the Government Forests in the District of Simla, Bashahr State, sheet No. 333* N. W./2, scale 4″=1 mile (ready for press).	1	
13	Map of the Government Forests in the District of Simla, Bashahr State, sheets Nos. 331 S. W./2, 331 S. W./3, 331† S. E./2, 331 S. E./3, 331 S. E./4, 332 N. E./1, 332* S. E./1, 333 N. W./1, 333† N. E./1, 333 N. E./3, 340* N. E./3, scale 4″=1 mile (in progress).	11	
14	Map of the Government Forests in the District of Simla, Bashahr State, sheets Nos. †347, 353, scale 1″=1 mile (in progress).	2	
15	Chart of Bashahr Triangulation, sheet No. *332, scale 1″=1 mile (ready for press).	1	
16	Chart of Bashahr Triangulation, sheets Nos. *331, *333, *348, scale 1″=1 mile (in progress).	3	
	ASSAM.		
17	Map of the Government Forests in District Goalpara, sheets Nos. 7 S. W./2 and 4, 7 N. E./3, 7 S. E./1, scale 4″= 1 mile (sent to press).	3	
18	Map of the Government Forests in District Goalpara, sheets Nos. 1 N. E./2, 1 N. E./4, 1 S. E./2, 2 N. E./4 and 9 N. W./3, 2 S. E./2 and 9 S. W./1, 7 S. E./2, 7 S. E./3, 7 S. E./4, 8 N. W./1, 8 N. W./2, 8 N. W./3, 8 N. W./4, 8 S. W./1, 8 S. W./3, 8 N. E./1, 8 N. E./2, 8 N. E./3, 8 N. E./4, 8 S. E./1, 8 S. E./2, 8 S. E./3, 8 S. E./4, scale 4″ = 1 mile (in progress).	22	
	BERAR.		
19	Map of Umbarde Reserve, Darwha Taluk, scale 8″ = 1 mile (published).	1	
20	Map of Phiski Reserve, Wun Taluk, scale 8″ = 1 mile (published).	1	
21	Map of Nidha Reserve, Kelapur Taluk, scale 4″ = 1 mile (sent to press).	1	
22	Map of Ghordara Reserve, Kelapur Taluk, scale 8″ = 1 mile (sent to press).	1	
23	Map of Babdi Reserve, Darwha Taluk, scale 4″ = 1 mile (sent to press).	1	
24	Map of Bhiwkund and Pownar Reserves, Wun Taluk, scale 8″ = 1 mile (sent to press).	2	
25	Map of Bhongnon and Borgaon Reserves, scale 8″ = 1 mile (sent to press).	2	
	Map of the Melghat Taluk, District Ellichpur, Berar, in three sheets, scale 1″=1 mile (in progress).	3	

* Reported in 1890-91 as being in progress.
† Reported in 1891-92 as being in progress.

No.	Particulars.	Number of sheets.	Remarks.
	Central Provinces.		
	NORTHERN CIRCLE.		
	Jubbulpur.		
27	Map of the Government Forests in the Jubbulpur Division, part of Jubbulpur Range, sheet No. $107^{\text{S. E.}}_{3}$, scale 4″ = 1 mile (published).	1	
28	Map of the Government Forests in the Jubbulpur Division, part of Jubbulpur Range, sheets Nos. $84^{*\text{S. E.}}_{3 \text{ and } 4}$ and $85_{1 \text{ and } 4}^{\text{N. E.}}$, $85^{*\text{N. E.}}_{3}$, $86^{*\text{S. W.}}_{2}$, $86^{*\text{S. W.}}_{4}$, $86^{*\text{S. E.}}_{2}$, $86^{*\text{S. E.}}_{3}$, $86^{*\text{S. E.}}_{4}$, $87^{*\text{N. W.}}_{3}$, $87^{*\text{N. W.}}_{4}$, $87^{*\text{N. E.}}_{1}$, $87^{*\text{N. E.}}_{2}$, $87^{*\text{N. E.}}_{3}$, $87^{*\text{N. E.}}_{4}$, $87^{*\text{S. E.}}_{1}$, $87^{*\text{S. E.}}_{2}$, $105^{\text{N. W.}}_{4}$, $105^{\text{S. W.}}_{1}$, $105^{\text{S. W.}}_{3}$, $105^{\text{N. E.}}_{4}$, $105^{\text{S. E.}}_{1 \text{ and } 3}$, $106^{*\text{N. W.}}_{1}$, $106^{\text{N. W.}}_{2}$, $106^{\text{N. W.}}_{4}$, $106^{\text{S. W.}}_{4}$ and $\frac{\text{S. E.}}{3}$ and $107^{\text{N. W.}}_{2}$, $106^{\text{N. E.}}_{1 \text{ and } 2}$, $106^{\text{N. E.}}_{4}$, $106^{\text{S. E.}}_{1 \text{ and } 3}$, $106^{\text{S. E.}}_{2}$, $106^{\text{S. E.}}_{4}$ and $107^{\text{N. E.}}_{2}$, $107^{*\text{S. W.}}_{2}$, $107^{*\text{S. W.}}_{3}$, $107^{*\text{S. W.}}_{4}$, $107^{*\text{S. E.}}_{1}$, $107^{*\text{S. E.}}_{2}$, $108^{*\text{N. W.}}_{1}$, $108^{*\text{N. W.}}_{2}$, $108^{*\text{N. W.}}_{3}$, $108^{*\text{N. W.}}_{4}$, $108^{*\text{S. W.}}_{1 \text{ and } 2}$, $108^{\text{N. E.}}_{1}$, $108^{*\text{N. E.}}_{3}$, $128^{\text{S. W.}}_{3}$, $128^{\text{S. W.}}_{4}$ and $129^{\text{N. W.}}_{2}$, $128^{\text{N. E.}}_{4}$, $128^{\text{S. E.}}_{2}$, $128^{\text{S. E.}}_{3}$ and $128^{\text{S. E.}}_{1}$, $128^{\text{S. E.}}_{4}$, $129^{\text{N. W.}}_{1 \text{ and } 2}$, $129^{\text{N. W.}}_{3}$, $129^{\text{N. W.}}_{4}$, $129^{\text{S. W.}}_{1}$, $129^{\text{S. W.}}_{2}$, $129^{\text{S. W.}}_{3}$, $129^{\text{S. W.}}_{4}$, $129^{\text{S. E.}}_{1}$ and $129^{\text{N. E}}_{3}$, $129^{\text{S. E.}}_{2}$, $129^{\text{S. E.}}_{3}$ and $130^{\text{N. E.}}_{1}$, $129^{\text{S. E.}}_{4}$, $130^{\text{N. W.}}_{3}$, $130^{\text{N. W.}}_{4}$, $130^{\text{S. W.}}_{1 \text{ and } 2}$, $130^{*\text{S. W.}}_{3}$, $130^{\text{N. E.}}_{2}$, $130^{\text{N. E.}}_{3}$, $130^{\text{N. E.}}_{4}$, $131^{\text{N. W.}}_{1}$, $131^{\text{N. W.}}_{3}$, scale 4″=1 mile (sent to press).	67	
29	Map of the Government Forests in the Jubbulpur Division, part of Jubbulpur Range, sheets Nos. $105^{\dagger\text{S. W.}}_{2}$, $105^{\dagger\text{S. W.}}_{4}$, $106^{\text{S. W.}}_{1 \text{ and } 2}$ and $106^{\text{N. W.}}_{4}$, $107^{\text{S. E.}}_{4}$, $108^{\text{S. W.}}_{3}$, $108^{\text{S. E.}}_{1}$, $108^{\text{S. E.}}_{3}$, $108^{\text{S. E.}}_{2 \text{ and } 4}$, $109^{\text{N. W.}}_{1}$, $109^{\text{N. W.}}_{3}$, $109^{\text{S. W.}}_{1}$, $131^{\text{S. W.}}_{1 \text{ and } 3}$, scale 4″= 1 mile (in progress).	12	
	Narsingpur.		
30	Index map to the Forest Surveys, District Narsingpur, scale 8 miles =1″ (published).	1	
	SOUTHERN CIRCLE.		
	Chanda.		
31	Map of the Ahiri Zemindari, District Chanda, sheets Nos. $122^{*\text{N. W.}}_{4}$ and $122^{\text{S. W.}}_{4}$, $122^{*\text{S. W.}}_{3 \text{ and } 4}$, $123^{*\text{N. W.}}_{1 \text{ and } 2}$, $123^{*\text{N. W.}}_{3 \text{ and } 4}$, $123^{*\text{S. W.}}_{1 \text{ and } 3}$, $123^{*\text{S. W.}}_{3 \text{ and } 4}$, scale 4″= 1 mile (sent to press).	6	
	Raipur.		
32	Map of the Government Forests in the District of Raipur, sheets Nos. $141^{*\text{S. E.}}_{2}$ and $164^{\text{S. W.}}_{1 \text{ and } 3}$, $141^{*\text{N. E.}}_{4}$ and $164^{\text{N. W.}}_{3}$, $187^{*\text{N. W.}}_{3}$, $187^{*\text{N. W.}}_{4}$, $187^{\text{S. W.}}_{1}$, $187^{*\text{S. W.}}_{3}$, $187^{\text{S. W.}}_{4}$, $187^{*\text{N. E.}}_{1}$, $187^{*\text{N. E.}}_{3}$, $187^{*\text{N. E.}}_{4}$, $187^{\text{S. E.}}_{1}$, $187^{\text{S. E.}}_{3}$, $208^{*\text{N. W.}}_{1}$, $208^{*\text{N. W.}}_{3}$, scale 4″ = 1 mile (sent to press).	14	

* Preliminary edition or Blue prints received.
† Reported in 1891-92 as being in progress.

No.	Particulars.	Number of sheets.	Remarks.
33	Map of the Government Forests in the District of Raipur, sheets Nos. 187*$\frac{S.W.}{2}$, 187$\frac{N.E.}{3}$, scale 4″=1 mile (ready for press).	2	
34	Map of the Government Forests in the District of Raipur, sheets Nos. 187$\frac{S.E.}{2}$, 187$\frac{S.E.}{4}$, 188$\frac{N.E.}{4}$, 188$\frac{S.E.}{2}$, 188$\frac{S.E.}{3}$, 188$\frac{S.E.}{4}$, 207$\frac{S.W.}{1}$, 207$\frac{S.W.}{3}$, 208$\frac{S.W.}{1}$, 208$\frac{S.W.}{3}$, scale 4″=1 mile (in progress).	10	
	Bhandara.		
35	Map of the Government Forests in the District of Bhandara, sheets Nos. 92†$\frac{N.W.}{3}$, 92†$\frac{N.W.}{4}$, 92$\frac{S.W.}{1}$, 92$\frac{S.W.}{2}$, 92$\frac{S.W.}{3}$, 92$\frac{S.W.}{4}$, 92†$\frac{N.E.}{3}$, 92$\frac{N.E.}{3}$, 92$\frac{N.E.}{4}$, 92†$\frac{S.E.}{1}$, 92†$\frac{S.E.}{2}$, 92$\frac{S.E.}{3 \text{ and } 4}$, 93†$\frac{N.W.}{2}$, scale 4″=1 mile (sent to press.)	13	
36	Map of the Government Forests in the District of Bhandara, sheets Nos. 93*$\frac{N.W.}{1}$, 93*$\frac{N.W.}{3}$, 93*$\frac{N.E.}{1}$, scale 4″=1 mile (ready for press).	3	
	Balâghat.		
37	Index map to the Forest Survey of District Balaghat, scale 8 miles=1″ (published).	1	
	Burma.		
	Pegu Circle.		
38	Map of the Kangyi Reserve, scale 2″=1 mile (published).	1	
	Tenasserim Circle.		
39	Map of the Government Forests in the east and west of Salween and part of Attaram Division, sheets Nos. 165$\frac{N.W.}{2 \text{ and } 4}$, and 165$\frac{N.E.}{1 \text{ and } 3}$, 165*$\frac{S.E.}{1}$, 165*$\frac{S.E.}{3}$, 165$\frac{S.E.}{4}$, 166$\frac{N.E.}{1}$, 166$\frac{N.E.}{3}$, 166$\frac{N.E.}{4}$, 166$\frac{S.E.}{2}$, 195$\frac{N.W.}{1 \text{ and } 3}$, 195$\frac{S.W.}{1}$, scale 4″=1 mile (in progress).	10	
	Upper Burma.		
40	Map of the proposed Laung Taung, Teak and Cutch Reserve, scale 1″=1 mile (published).	1	
41	Map of the proposed Mouk Kunze, Teak and Cutch Reserve, scale 1″=1 mile (published).	1	
42	Index map to the Forest Survey of District Pyinmana scale 1″=8 miles (published).	1	
	Tracings made.		
43	Tracings made for various Forest and District officers	114	
	Map colouring.		
44	Printed maps of various kinds coloured	1,623	

* Reported in 1891-92 as being in progress.
† Preliminary edition or Blue prints received.

No.	Particulars.	Number of sheets.	Remarks.
	Mounted maps.		
45	Printed maps mounted in book form	666	
46	Computation volumes and other books bound . .	92	
	Forest growth.		
47	Map of the Government Forests in Bashahr in the District of Simla, sheets Nos. $332\frac{S.W.}{3}$, $346\frac{N.E.}{4}$, scale 4″=1 mile (in duplicate).	4	
48	Map of the Government Forests in the District of Jubbulpur, Central Provinces, sheets Nos. $84_{3\text{ and }4}^{S.E.}$ and $85_{3\text{ and }4}^{N.E.}$, $86\frac{S.W.}{2}$, $86\frac{S.W.}{4}$, $86\frac{S.E.}{2}$, $86\frac{S.E.}{3}$, $87\frac{N.W.}{3}$, $87\frac{N.E.}{1}$, $87\frac{N.E.}{2}$, $87\frac{N.E.}{3}$, $87\frac{N.E.}{4}$, $87\frac{S.E.}{1}$, $107\frac{S.W.}{3}$, $107\frac{S.W.}{3}$, $107\frac{S.W.}{4}$, $107\frac{S.E.}{1}$, $107\frac{S.E.}{2}$, $108\frac{N.W.}{1}$, $108\frac{N.W.}{2}$, $108\frac{N.W.}{3}$, $108\frac{N.W.}{4}$, $130\frac{S.W.}{3}$, scale 4″=1 mile (in duplicate).	42	
49	Map of the Government Forests in the District of Rajpur, Central Provinces, sheets Nos. $187\frac{S.W.}{3}$, $187\frac{N.E.}{1}$, $187\frac{N.E.}{2}$, $207\frac{S.W.}{1}$, $207\frac{S.W.}{3}$, $208\frac{N.W.}{1}$, $208\frac{N.W.}{3}$, scale 4″=1 mile.	7	
	India.		
	Map of India showing the distribution of Forest areas under the Indian Forest Laws up to 1st April 1892 and the limits of Forest charges, scale 1″=48 miles . . .	1	
	Maps for Exhibition.		
	Maps sent to Chicago Exhibition (1893)—Forests, etc., added by hand.	220	

APPENDIX C.

Summary of Expenditure from 1st October 1892 to 30th September 1893, showing the amounts expended in the Field and Office Works of the Forest Surveys (Imperial).

No	Months.	Central Provinces.																Punjab.			Assam.			North-Western Provinces and Oudh.									Burma.						Berar.			Grand Total.
		Jubbulpur.			Narsingpur.			Raipur.			Bhandara.			Balaghat.			Chanda.	Bagnahr.			Goalpara.			Tehri-Garhwal and Jaunsar.	Naini Tal.	Oudh Circle. Pilibhit.			Oudh Circle. Bhira.			Tenasserim Circle.			Pyinmana.			Melghat.	Imperial Head-Quarters.		
		Field.	Office.	General.	Field.	Office.	General.	Field.	Office.	General.	Field.	Office.	General.	Field.	Office.	General.	General.	Field.	Office.	General.	Field.	Office.	General.	General.	General.	Field.	Office.	General.	Field.	Office.	General.	Field.	Office.	General.	Office.					
		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
1	October 1892	...	167	109	...	...	...	...	172	232	...	7	50	...	...	50	...	1,628	265	150	...	136	216	...	...	...	67	50	...	...	...	...	306	150	...	...	...	12	2,512	6,279
2	November ,,	...	25	227	...	...	...	...	28	196	...	8	119	...	...	...	...	3,312	117	100	...	70	58	...	...	...	17	50	...	...	...	...	115	50	...	...	50	12	2,491	6,917
3	December ,,	10	94	113	...	...	124	...	75	113	240	150	218	...	...	200	...	...	100	...	108	224	571	...	...	135	102	71	...	...	180	...	103	110	...	108	1,680	22	1,199	5,986
4	January 1893	344	179	481	332	150	204	485	...	1,216	633	19	152	...	...	200	...	...	494	149	1,009	...	1,341	194	...	357	...	363	...	...	300	4	10	1,242	1,879	...	2,795	...	2,144	18,692
5	February ,,	739	43	239	1,281	...	200	811	118	275	911	...	145	...	...	100	...	...	163	85	1,479	...	444	167	...	377	...	101	...	...	...	2,029	...	2,409	1,418	...	209	32	1,396	15,171
6	March ,,	385	20	147	594	60	430	1,746	32	169	682	...	188	...	49	200	...	...	153	173	1,546	...	120	...	...	377	...	270	...	...	100	2,389	...	473	1,694	...	125	156	1,601	13,863
7	April ,,	436	92	103	494	...	52	...	18	50	175	...	50	591	...	50	...	...	155	50	1,447	...	152	...	...	377	10	50	...	...	50	...	5	166	1,672	...	131	42	1,371	7,839
8	May ,,	442	117	102	559	...	50	1,888	...	100	...	...	...	813	...	50	...	...	131	100	1,422	...	788	...	...	90	...	...	337	21	306	2,730	10	1,584	...	...	59	22	1,538	13,222
9	June ,,	9	138	3	1,240	...	316	937	12	50	...	...	...	709	...	...	...	...	180	600	1,182	...	960	...	...	...	...	...	446	...	96	...	107	...	2,999	...	1,016	16	1,589	12,605
10	July ,,	150	96	325	17	32	145	...	29	50	...	...	30	601	...	343	108	1,179	285	629	1,134	65	763	...	191	...	59	...	...	...	...	...	60	50	409	...	1,764	25	2,881	11,385
11	August ,,	...	219	103	...	100	100	928	...	674	...	78	139	58	60	293	...	21	294	776	...	790	100	...	...	...	128	13	...	...	50	...	5	...	...	228	69	61	1,795	7,098
12	September ,,	...	79	142	...	12	100	...	34	174	...	224	50	...	7	50	...	1,545	285	886	...	195	50	...	145	...	26	25	...	...	25	...	95	50	...	329	50	86	3,762	8,126
	Total	2,565	1,264	2,091	4,517	354	1,717	6,767	513	3,329	2,651	475	1,192	2,772	107	1,536	108	7,685	2,582	3,698	9,327	1,490	5,535	361	336	1,723	409	993	783	21	1,027	7,151	316	6,284	0,061	665	7,929	480	28,189	1,25,513
		5,920			6,588			10,609			4,318			3,415			108	13,975			16,352			361	336	3,125			1,831			14,251			18,655			480	28,189	1,25,513
		31,958																13,975			16,352			5,653						32,906						480	28,189	1,25,513

APPENDIX D.

Area topographically surveyed by the Forest Survey Department during 1892-93.

Province.	Forest Division.	Area in square miles.			Remarks.
		Demarcated Forests.	Other lands.	Total.	
Central Provinces	Jubbulpur	82	35	117	
	Narsingpur	60	30	90	
	Raipur	160	26	186	
	Bhandara	80	...	80	
	Balaghat	89	...	89	
Punjab	Bashahr	4	750	754	All forests in Bashahr, whether demarcated or not, are leased by the Punjab Government.
Oudh	Pilibhit	153	...	153	
	Bhira	98	...	98	
Assam	Goalpara	37	89	126	
Burma	Tenasserim	88	23	111	
	Total.	851	953	1,804	

APPENDIX E.

List and description of Pillars on the Goalpara-Bhutan Boundary, Assam.

Serial number of Pillars.	DISTANCE ON THE MERIDIAN (From the origin of Forest Surveys. Latitude 26°30′00″) Chains.	DISTANCE ON THE PERPENDICULAR (Longitude 90°30′00.″) Chains.	Remarks.
50	N. 1310·86	W. 2933·74	Original mark, a small rectangle of stone, is 22 links to the north and 19 links east of the adjacent Trigonometrical (tree) station 50.
51	„ 1238·70	„ 2763·61	Fixed by traverse. Indication of original mark.
52	„ 1234·17	„ 2420·12	Fixed by traverse. Mound of earth and stones, apparently original mark.
53	„ 1280·42	„ 2216·26	A mound of earth and stones resembling original mark. The pillar is 15 links north and 20 links east of the adjacent Trigonometrical (tree) station 53.
54	„ 1270·46	„ 2011·39	Original mark not found. The pillar is placed 84 links south and 44 links east of the adjacent Trigonometrical (tree) station 54.
55	„ 1302·52	„ 1887·37	Original rectangle covered with earth. The pillar is 36 links north of the adjacent Trigonometrical (tree) station 55.
56	„ 1396·65	„ 1564·66	Original mark found. The pillar is 54 links north and 16 links west of the adjacent Trigonometrical (tree) station 56.
57	„ 1504·17	„ 1291·46	Fixed by traverse. Original mark, a cairn of stones, found.
58	„ 1691·14	„ 1328·42	Original mark not found. Approximate site chosen. Fixed by traverse.
59	„ 1845·68	„ 1262·82	By traverse. Original mark not found. Pillar placed approximately at safe distance from bank.
60	„ 1977·16	„ 1115·52	Fixed by traverse. Original mark found, a cairn of stones.
61	„ 1977·96	„ 1025·28	Fixed by traverse. Original mark found. Small mound of earth and stones.
62	„ 1944·24	„ 857·36	Fixed by traverse. Mark doubtful, a mound of earth and stone. There being no other mark anywhere near, this was retained and enlarged.
63	„ 1920·98	„ 771·99	Fixed by traverse. Doubtful remains of original mark on edge of bank. Pillar built on a higher bank about 1 chain to the west.
64	„ 2069·81	„ 541·83	Fixed by traverse. Original site washed away. New site selected 4½ chains to west.
65	„ 2207·94	„ 497·10	By traverse. No mark found. Ground covered with stones. Pillar built on a clear spot on the bank.
66	„ 2226·39	„ 191·88	By traverse. Original site washed away. Site selected on bank.
67	„ 1900·78	E. 234·72	By triangulation and traverse. Original cairn of stones found.
68	„ 1740·56	„ 446·02	By traverse. Approximate site. Original not found.
69	„ 1670·35	„ 633·43	By triangulation and traverse. Original mark found.
70	„ 1616·99	„ 880·09	By triangulation and traverse. Original mark found here on edge of bank falling away.
70	„ 1617·21	„ 881·24	Pillar built here on a safer site north-east of original.
71	„ 1521·89	„ 940·89	By triangulation. Found original mark, a large mound of earth and stones.
72	„ 1563·90	„ 1086·13	By triangulation. Pucka pillar, evidently on original site.
73	„ 1489·32	„ 1171·67	By triangulation. Approximate site. Original not found.
74	„ 1476·86	„ 1288·95	By triangulation. Approximate site. Original not found. Pillar placed 1 chain east of existing masonry pillar.
75	„ 1513·98	„ 1413·92	By triangulation. Original not found, but pucka pillar on site evidently correct.
76	„ 1521·27	„ 1780·39	By triangulation. Original not found, but pucka pillar on site evidently correct.
77	„ 1541·12	„ 2004·90	By triangulation. Original site washed away. Placed on existing bank of river.
78	„ 1587·60	„ 2472·61	By triangulation. Revenue Survey co-ordinates not given for this pillar, but site evidently correct.
79	„ 1570·31	„ 2487·02	This pillar is on the left bank of the Manes in the Kamrup District.

ANNUAL FORM No. 61 (*Prescribed*).

FOREST DEPARTMENT, INDIA, FOREST SURVEYS.

Summary of Revenue of the different Divisions for the Forest year 1892-93.

	R	a.	p.
RECEIPTS.			
I.—Timber and other produce removed from the forests by Government agency—			
a. Timber	...		
b. Firewood and charcoal	...		
c. Bamboos	...		
d. Sandal-wood	...		
e. Grass and other minor produce	...		
II.—Timber and other produce removed from the forests by consumers or purchasers—			
a. Timber	...		
b. Firewood and charcoal	...		
c. Bamboos	...		
d. Grazing and fodder grass	...		
e. Other minor produce	...		
III.—Drift and Waif Wood and Confiscated Forest Produce—			
IV.—Revenue from forests not managed by Government—			
a. Duty on foreign timber and other forest produce	...		
b. Revenue from shared and private forests	...		
V.—Miscellaneous—			
a. Fines and forfeitures	...		
b. Refunds	97	0	0
c. Other sources	609	0	0
TOTAL RECEIPTS	706	0	0

Summary of Expenditure of the different Divisions for the Forest year 1892-93.

A.—CONSERVANCY AND WORKS.	R	a.	p.
I.—Timber and other produce removed from the forests by Government agency—			
a. Timber			
b. Firewood and charcoal	...		
c. Bamboos	...		
d. Sandal-wood	...		
e. Grass and other minor produce	...		
II.—Timber and other produce removed from the forests by consumers or purchasers	...		
III.—Drift and Waif Wood and Confiscated Forest Produce—			
IV.—Revenue from forests not managed by Government—			
a. Duty on foreign timber and other forest produce	...		
b. Revenue from shared and private forests	...		
V.—Rent of leased Forests and payments to Shareholders in forests managed by Government	...		

ANNUAL FORM No. 61 (*Prescribed*)—continued.

FOREST DEPARTMENT, INDIA, FOREST SURVEYS.

Summary of Expenditure of the different Divisions for the Forest year 1892-93.

VI.—Live Stock, Stores, Tools and Plant—			
a. Purchase of cattle	...		
b. Feed and keep of cattle	...		
c. Purchase of stores, tools and plant	2,108	0	0
VII.—Communications and Buildings—			
a. Roads and bridges	...		
b. Buildings	...		
c. Other works	...		
VIII.—Demarcation, improvement, and extension of forests—			
a. Demarcation	...		
b. Compensation for land and rights	...		
c. Surveys	4,730	0	0
d. Working-plans	..		
e. Sowing and planting	...		
f. Protection from fire	...		
g. Other works	...		
IX.—Miscellaneous—			
a. Refunds	8	0	0
b. Law charges	...		
c. Other charges	322	0	0
TOTAL A.—CONSERVANCY AND WORKS	7,168	0	0
B.—ESTABLISHMENT.			
I.—Salaries—			
a. Conservators	...		
b. Superior Officers	6,750	0	0
c. $\frac{c}{1}$ Upper Subordinate Establishments	750	0	0
c. $\frac{c}{2}$ Lower Subordinate Establishments	7,033	0	0
c. Deputation and special allowances	...		
II.—Travelling allowances—			
a. Conservators	...		
b. Superior Officers	22	0	0
c. $\frac{c}{1}$ Upper Subordinate Establishments	...		
c. $\frac{c}{2}$ Lower Subordinate Establishments	...		
III.—Contingencies—			
a. Stationery	63	0	0
b. Carriage of tents and records	106	0	0
c. Rents, rates and taxes	1,500	0	0
d. Pay of police guards	...		
e. Official postage	445	0	0
f. Sundries	2,825	0	0
TOTAL B.—ESTABLISHMENTS	19,494	0	0
GRAND TOTAL OF EXPENDITURE	26,662	0	0

ANNUAL FORM No. 61 (*Prescribed*)—continued.

FOREST DEPARTMENT, INDIA, FOREST SURVEYS.

Summary of Revenue of the different Divisions for the Forest year 1892-93.

RECEIPTS.

I.—Timber and other produce removed from the forests by Government Agency—			
a. Timber	...		
b. Firewood and charcoal	...		
c. Bamboos	...		
d. Sandal-wood	...		
e. Grass and other minor produce	...		
II.—Timber and other produce removed from the forests by consumers or purchasers—			
a. Timber	...		
b. Firewood and charcoal	...		
c. Bamboos	...		
d. Grazing and fodder grass	...		
e. Other minor produce	...		
III.—Drift and Waif Wood and Confiscated Forest Produce—			
IV.—Revenue from forests not managed by Government—			
a. Duty on foreign timber and other forest produce	...		
b. Revenue from shared and private forests	...		
V.—Miscellaneous—			
a. Fines and forfeitures	...		
b. Refunds	97	0	0
c. Other sources	609	0	0
TOTAL RECEIPTS	706	0	0

Summary of Expenditure of the different Divisions for the Forest year 1893-93.

A.—CONSERVANCY AND WORKS.

	R	*a.*	*p.*
I.—Timber and other produce removed from the forests by Government Agency—			
a. Timber	...		
b. Firewood and charcoal	...		
c. Bamboos	...		
d. Sandal-wood	...		
e. Grass and other minor produce	..		
II.—Timber and other produce removed from the forests by consumers or purchasers.			
III.—Drift and Waif Wood and confiscated Forest Produce—			
IV.—Revenue from forests not managed by Government—			
a. Duty on foreign timber and other forest produce	...		
b. Revenue from shared and private forests	...		
V.—Rent of leased forests and payments to Shareholders in forests managed by Government—			
VI.—Live Stock, Stores, Tools and Plant—			
a. Purchase of cattle	...		
b. Feed and keep of cattle	5,951	0	0
c. Purchase of stores, tools and plant	4,173	0	0

ANNUAL FORM No. 61 (*Prescribed*)—continued.

FOREST DEPARTMENT, INDIA, FOREST SURVEYS.

Summary of Expenditure of the different Divisions for the Forest year 1892-93.

VII.—Communications and Buildings—			
a. Roads and bridges	...		
b. Buildings	...		
c. Other works	...		
VIII.—Demarcation, improvement, and extension of forests—			
a. Demarcation	...		
b. Compensation for land and rights	...		
c. Surveys	55,410	0	0
d. Working-plans	...		
e. Sowing and planting	...		
f. Protection from fire	...		
g. Other works	...		
IX.—Miscellaneous—			
a. Refunds	8	0	0
b. Law charges	...		
c. Other charges	34	0	0
TOTAL A.—CONSERVANCY AND WORKS	65,876	0	0

B.—ESTABLISHMENT.

I.—Salaries—			
a. Conservators	...		
b. Superior Officers	25,600	0	0
c/1. Upper Subordinate Establishments	11,390	0	0
c/2. Lower Subordinate Establishments	19,047	0	0
d. Deputation and special allowances	1,445	0	0
II.—Travelling Allowances—			
a. Conservators	...		
b. Superior Officers	6,670	0	0
c/1. Upper Subordinate Establishments	6,192	0	0
c/2. Lower Subordinate Establishments	12,587	0	0
III.—Contingencies—			
a Stationery	65	0	0
b. Carriage of tents and records	1,674	0	0
c. Rents, rates and taxes	1,638	0	0
d. Pay of police guards	...		
e. Official postage	481	0	0
f. Sundries	4,739	0	0
TOTAL B.—ESTABLISHMENTS	91,528	0	0
GRAND TOTAL OF EXPENDITURE	1,57,404	0	0

ANNUAL FORM No. 62 (*Prescribed*).

FOREST DEPARTMENT, INDIA, FOREST SURVEYS.

Account Current for the Forest year 1892-93.

	R a. p.	R a. p.		R a. p.	R a. p.
To Cash Balance . .	...	...	By Expenditure as per Annual Summary Form No. 61 . .	...	86,662 7 6
To VIII.—Assessed Taxes—Income Tax—Deductions from salaries .	...	1,158 7 8	By Deposits . . .	...	...
To Revenue as per Annual Summary, Form No. 61 .	...	706 1 6	By Forest Cash Remittances—Local—		
To Service Funds—			Remittances to Treasuries . . .	...	...
Civil Fund—Ordinary, Bengal . . .	...	...	Inter-Divisional Transfers . . .	...	...
Civil Fund—Additional, Bengal . . .	...	...	By Advances Recoverable	...	1,31,057 0 1
Military Fund—Bengal .	...	...	By Suspense . .	...	...
Military Fund—Madras	...	...	By Account Current (other Governments)—		
Military Orphan Fund—Bengal . . .	...	...	Remittances to the Government of—		
Uncovenanted Service Family Pension Fund, Bengal . .	378 9 0	...	N.-W. P. and Oudh .	5,366 3 10	...
General Family Pension Fund . . .	...	...	Central Provinces .	39,361 14 1	...
Hindu Family Annuity Fund . . .	...		Assam . . .	21,848 12 7	...
		378 9 0	Punjab . . .	20,892 6 0	...
To Deposits . . .	...	...	Burma . . .	43,587 12 8	...
To Forest Cash Remittances—Local—	...		Bengal . . .	35 6 0	
Forest cheques drawn	0 11 10				1,31,092 7 2
Inter-Divisional Transfers . . .	...		By Account Current with Foreign States—		
		0 11 10	Berar Suspense Accounts	...	757 2 0
To advances recoverable .	...	1,20,198 4 2			
To suspense . . .	...	...	By Inter-Departmental Transfers—		
To Account Current (other Governments)—			Public Works Department . . .	...	...
Remittances from Government of—			Military Department, Bengal . . .	56 6 0	...
N.-W. P. and Oudh .	78,632 8 1	...	Civil Department—		
Central Provinces .	28,848 4 8	...	Survey of India .	35 6 0	...
Punjab . . .	4,088 0 0	...	Cash Balance . . .	...	91 12 0
Burma . . .	29,414 8 10	...			
Assam . . .	12,039 0 0	...			
Bengal . . .	12 9 3	...			
		1,52,534 14 10			
To Inter-Departmental Transfers—					
Public Works Department . . .	...	...			
Military Department, Bengal . . .	303 13 9	...			
Civil Department—					
Survey of India .	3,239 8 0	...			
Mathematical Instrument Department .	2,140 6 0	...			
Miscellaneous . .	...				
		5,683 11 9			
TOTAL .	...	2,89,660 12 9	TOTAL .	...	2,89,660 12 9

ANNUAL FORM NO. 64 (*Prescribed*).

FOREST DEPARTMENT, INDIA, FOREST SURVEYS.

Outstandings and Liabilities on account of Contractors and Disbursers for the Forest year 1892-93.

Division.	Department Debtor.			Department Creditor.			Balance due.	
	At commencement of year.	Recoveries in cash and value of supplies and work done during the year.	At close of year.	At commencement of year.	Payments made during year.	At close of year.	To Department (Outstandings).	By Department (Liabilities).
	R a. p.	R a. p.	R a. p.	R a. p.	R a. p.	R a. p.	R a. p.	R a. p.
Forest Surveys .	1,29,198 4 2	1,29,198 4 2	7,848 14 3	1,31,057 0 1	1,38,905 11 4	9,707 10 2		

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